THE OIL WEEKLY

ENGINEERING « NEWS » STATISTICS

EDITORIAL STAFF

WARREN L. BAKER
Editor

J. KENT RIDLEY
Managing Editor

ASSOCIATE EDITORS

L. J. LOGAN — WM. V. GROSS

DISTRICT EDITORS

B. F. LINZ.....Washington
J. V. HIGHTOWER.....New York
FRANK TAYLOR.....Tulsa
H. H. KING.....Fort Worth
EARL S. POST.....San Antonio
R. W. BYRAM.....Austin
ELTON STERRETT, GILBERT M. WILSON, GORDON B. NICHOLSON, RIVERS REAVES.....Houston

PUBLISHED BY

THE GULF PUBLISHING COMPANY

HOUSTON, TEXAS

R. L. DUDLEY, *President*
A. L. BURNS, *General Manager*
S. W. ROBINSON, *Editorial Director*
TOM W. NELSON, *Advertising Manager*

Staff correspondents at all important points.

Member Audit Bureau of Circulation
Member Associated Business Papers, Inc.

BRANCH OFFICES

NEW YORK.....250 Park Ave.
PITTSBURGH.....Vandergrift Bldg.
CHICAGO.....332 S. Michigan Ave.
LOS ANGELES.....W. W. Wilson Bldg.
Huntington Park, Calif.
TULSA..... Hunt Bldg.
FORT WORTH.....W. T. Waggoner Bldg.
WASHINGTON.....Albee Bldg.

ADVERTISING STAFF

DICK SWINSKY.....New York
C. A. WARDLEY.....Pittsburgh
H. G. FITZPATRICK.....Chicago
J. F. CARTER, JR.....Tulsa
JAY CURTS, JR.....Los Angeles
CHAS. WYATT.....Houston

CIRCULATION DEPARTMENT

J. T. WAGONER.....Manager

SPECIALIZED OIL JOURNALS

Published by

THE GULF PUBLISHING COMPANY

The Oil Man's Calendar

FEB. 9–12	American Institute of Mining and Metallurgical Engineers, Annual Meeting, New York.
26–27	American Petroleum Institute Division of Production, Southwestern District, Dallas, Texas.
28	North Texas Oil and Gas Association, Wichita Falls, Texas.
MAR. 23–25	American Society of Mechanical Engineers, Houston, Texas.
APRIL 16–17	National Petroleum Association, Thirty-ninth Semi-Annual Meeting, Hotel Cleveland, Cleveland, Ohio.
21–24	American Association of Petroleum Geologists, Twenty-seventh Annual Meeting, Cosmopolitan Hotel, Denver, Colorado.
22–24	Petroleum Industry Electrical Association, Shreveport, Louisiana.
NOV. 9–13	American Petroleum Institute, Chicago.

Contents « December 22, 1941

Volume 104, Number 3

The Changing Panorama..... 9

Feature Section:

Washington Roundup..... 11
BY B. F. LINZ

A Few Comments on Ickes' War Assignment..... 15

Improved Rebuilding Methods Extending Tool-Joint Life..... 16
BY ELTON STERRETT

Discovery Trends Indicate New Prospecting Methods Needed..... 32
BY ESME EUGENE ROSAIRE

Design of Casing Strings (Part 4)..... 36
BY EMORY N. KEMLER

Practical Operating Hints for the Drilling Rig..... 42

Practical Operating Hints for the Production Man..... 46

News Section and Index..... 49

Looking Ahead with the Editor..... 2

Notes for the Equipment Buyer and User..... 71

Squeaks from the Bull Wheel..... 70

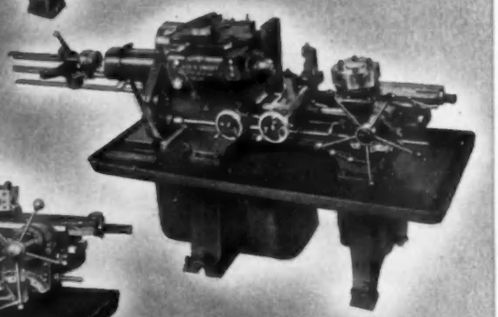
Index to Advertisers..... 72

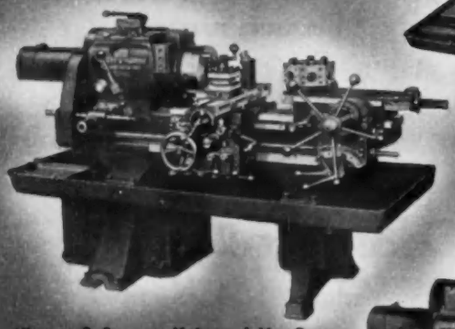
Published every Monday. Single Copies 15 cents (Special Issues 50c). Subscription price: domestic and foreign, $2.00 a year; 2 years $3.00. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879. Subscription restricted to those engaged in the producing and pipe line branches of the oil industry or the manufacturing and distribution of oil field supplies. Advertising rates on application.

Copyrighted 1941 by The Gulf Publishing Company.

WALK-DON'T RUN TO THE *Safest* EXIT!

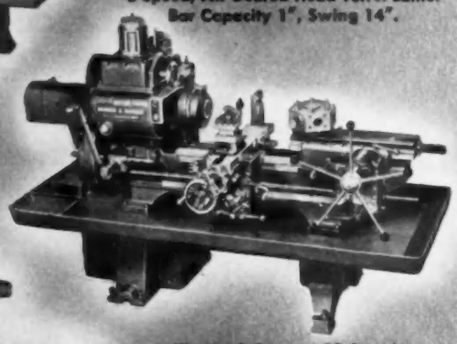
Warner & Swasey Electric Turret Lathe.
No. 1. Bar Capacity ⅝", Swing 11".
No. 2. Bar Capacity 1", Swing 14".

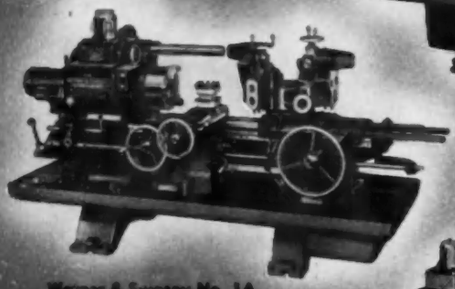




Warner & Swasey No. 2
6 Speed, All Geared Head Turret Lathe.
Bar Capacity 1", Swing 14".

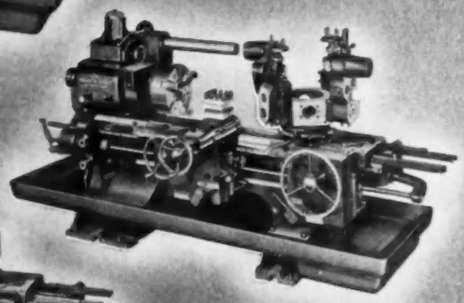
Warner & Swasey Universal No. 3
6 Speed, All Geared Head Turret Lathe.
Bar Capacity 1⅛", Swing 18⅛".

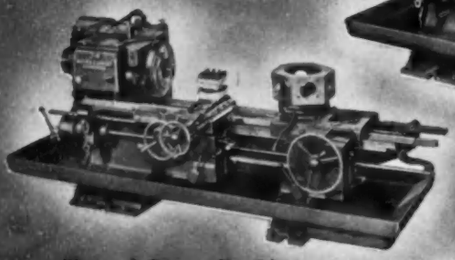




Warner & Swasey 12 Speed
All Geared Head Turret Lathe.
No. 4. Bar Capacity 2", Swing 18⅛".
No. 5. Bar Capacity 2½", Swing 20"

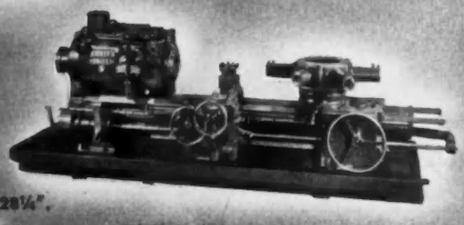
Warner & Swasey No. 1A
Universal Heavy Duty Turret Lathe.
Bar Capacity 2⅛", Swing 16¼".





Warner & Swasey No. 2A
Universal Heavy Duty Turret Lathe.
Bar Capacity 3½", Swing 20".

Warner & Swasey No. 3A
Universal Heavy Duty Turret Lathe.
Bar Capacity 4¼" or 6", Swing 23½".



Warner & Swasey No. 4A
Heavy Duty Turret Lathe.
Bar Capacity 8", 9" or 12", Swing 28¼".

YOU CAN TURN IT BETTER, FASTER, FOR LESS
. . . WITH A WARNER & SWASEY

It doesn't pay to get panicky in *any* emergency. Don't be stampeded into rushing for "anything" you can get quickly. If you need turret lathes, you will probably have to wait longer for deliveries of new Warner & Swaseys. But remember—a machine tool, such as a turret lathe, will be in your service long after this emergency is over, and don't let pressure cause you to lose sight of these important extras that come wrapped up with the purchase of a Warner & Swasey Turret Lathe:

DESIGN FEATURES in a complete line of Ram and Saddle Type, from ⅝" to 12" bar capacity, that insure better accuracy, higher speeds, and greater ease of operation.

A LARGE INVENTORY OF PARTS for prompt maintenance of *all* models of Warner & Swasey Turret Lathes. *A Warner & Swasey Turret Lathe never becomes an orphan!*

COMPLETE REFERENCE RECORDS maintained on every machine in service.

A COMPLETE LINE of the most modern bar and chucking tools.

FIELD ENGINEERS for on-the-spot studies and recommendations.

FACTORY ENGINEERS who check your methods, make time studies, improve setups, and if necessary, design and build special tools.

SERVICE MEN who are practical demonstrators and shop assistants in your own plant.

OPERATOR TRAINING SERVICE—a special department to make men better turret lathe operators.

There are many ways we can help turret lathe users during the emergency. Write

The Changing Panorama

OPC Apparently Has Something Brewing

Actions Indicate Industry Can Expect a War Operating Program Shortly

The OPC telegraphic request to the Texas Railroad Commission that it delay fixing a production allowable quota for January until OPC finishes studying the current situation, would seem to indicate that something important is brewing and is due to break immediately. Otherwise OPC probably would not have made such a request.

Now that the nation is in the midst of war, there is a possibility that the Office of the Petroleum Coordinator may be preparing to issue a far-reaching federal plan definitely detailing a program of operation for the industry. Whether sufficient time has elapsed to establish a program covering all phases of the industry is problematical, depending upon the progress made in this direction prior to actual entry into the war. However, the request to the Texas Railroad Commission is certainly indicative that some change in at least the production allowable picture is contemplated at once. Since the need for oil production assuredly will be greater and not less, OPC may be studying the immediate need for larger allowables. Due to the critical situation with respect to the supply of aviation gasoline, which OPC has been studying recently, it may be that some plan of revising allowable schedules to assist in this matter may be issued.

Crude Oil Demand . . .

Petroleum Coordinator Ickes' war assignment to the oil industry calling for the production of at least 1,500,000,000 barrels of crude oil during 1942, represents an increase of approximately 100 million barrels over the 1,400,000,000 barrels that will be produced in 1941. On this basis the quantity of additional oil the industry must produce the coming year appears sizeable, however the coordinator's figure actually represents no increase over the daily rate of production since late October. To produce the 1½ billion barrels annually asked by Ickes would require an average daily yield of about 4,110,000 barrels, and the industry has been producing at this rate.

Therefore, it would appear that the industry already has fulfilled one of its war assignments, and perhaps the most important one. However, while current daily output is at the desired rate, the industry has not shown whether it can sustain this over long periods. Certainly, many wells must be drilled and new fields found to offset the constant decline in productivity of fields. Moreover, it appears that the coordinator has selected the minimum production requirement, as it is likely enlarged military and industrial activities will boost consumption to peaks well above current levels. And in this connection it should be noted that the coordinator used the word "at least 1½ billion barrels."

It would be wise for the industry to expect to be required to produce more than 1½ billion barrels.

Seven-Day Texas Week . . .

The quickest and simplest means of increasing United States crude oil production would be adoption of a 7-day producing week in Texas. Several defense manufacturing industries, at the urging of government, have gone on a 7-day week and other states permit oil production every day of the week, so why not the Texas oil industry?

The idea seems especially suited to existing conditions. The increase could be obtained overnight, without awaiting the drilling of additional wells or being dependent upon finding new fields. It would not be necessary to raise the daily per-well allowable, in fact it might have to be trimmed slightly to prevent too great a production right now, and thus a 7-day producing week appears the most logical way of getting larger yields from existing wells with the least amount of physical strain on reservoir energies. Another possible advantage would be greater protection against sabotage, as field workers would be present on the lease every day and thus have a better opportunity to detect, guard and warn against suspicious characters or occurrences, whereas today the shut-in leases are not visited for two consecutive days in most instances.

Elimination of the two-day-a-week holiday in Texas fields probably could boost output 400,000 barrels per day by leaving in force the same daily proration allowances now in effect. This would give the state a total daily yield of 1,900,000 barrels. If an increase of only, let us say, 200,000 barrels per day is desired, it would seem logical, because of sabotage protection afforded and likelihood that reservoirs would suffer less physical damage if production is taken in slower and steadier volumes, to remove the Texas production holidays and reduce the daily rate.

Texas Field Survey . . .

A survey detailing various Texas oil fields that can increase their output materially without physical waste, and fields producing high-octane crude oil has been placed in the hands of Petroleum Coordinator Ickes, according to Col. E. O. Thompson of the Texas Railroad Commission.

In answer to a question, Thompson stated the commission's survey indicated production in Texas probably could be increased slightly more than half a million barrels daily without physical waste, adding "This, of course, is only an estimate which would be tempered by actual experience if need for increasing the production arises."

The entire commission is in full accord with the federal government on all matter relating to production, Thompson told THE OIL WEEKLY, and said it is the intention of the commission to help get the oil where it can be obtained with the greatest dispatch.

"The big need is for new discoveries," reiterated Thompson. Asked if the Texas Railroad Commission could aid in this matter, he gave an emphatic answer: "yes."

He pointed out that under conservation statutes, a field can be allowed to produce up to 10,000 barrels daily before being curtailed

by proration. He reasserted his belief (see page 9, THE OIL WEEKLY, December 15, 1941) that a bonus of as much as 1000 barrels per day to 10,000-foot discovery wells until 10 wells are completed in the field and an allowable of 500 barrels daily for 5000-foot discovery wells until 20 wells are completed, would help increase wildcat prospecting.

Rubber . . .

The Japanese attack in the Pacific Ocean seriously threatens the world's rubber supplies, since 97 percent of all rubber comes from the Far East. Hence the United States government order stopping sale of automobile tires.

Aside from the rubber, bus and truck industries, the order probably has a greater influence on petroleum than most other businesses. Few other enterprises employ as many cars and trucks as oil, and these are among the most consistent long-distance travelers. Furthermore, the order is indicative of forthcoming increased efforts to expand the synthetic rubber tire industry, which has been established in the past 18 months. This means another new market for petroleum, as it is the basic ingredient. Several thousand of these petroleum synthetic tires have been sold and reportedly are giving very satisfactory performance.

The petroleum industry should take the rubber situation seriously. It should undertake steps immediately to expand its production of the necessary ingredients, so the nation will not be caught short of this vital commodity. Meanwhile, all drivers should give their tires the best of care. The tire companies and filling stations will be glad to give advice on tire maintenance.

Spindletop Strike . . .

Apparently a new major oil strike has been made in the vicinity of famed Spindletop, generally credited as the birthplace of the now multi-billion-dollar Texas oil industry. Discovery of a new important field in this region after 41 years of intensive prospecting should give strong encouragement to the belief that the United States has not yet reached the stage where a decline in oil discoveries can be expected.

Standardization Aids Both Oil and War

Without Standards Industry's Equipment Needs Would Be Even Greater

Standardization of equipment is an achievement of which the industry may be rightfully proud, especially at this moment when war is creating an acute shortage of steel. No one can deny that were it not for the improved and simplified specifications, interchangeability, and reductions in sizes achieved through equipment standardization, the industry would require many additional tons of steel to drill, complete and produce the large number of new wells that are going to be necessary to provide sufficient petroleum to meet consumptive demands.

Standardization of equipment had its inception during the days of World War I, but it was not until after a long, hard, uphill fight that it blossomed forth under the auspices of the American Petroleum Institute in 1924 and became an actuality in practice as well as talk. Since that time its scope of work has broadened and progressed steadily, until 9/10 of the industry's stock materials are said to conform to API specifications. Standardization is as active now as in earlier days, approximately 600 different individuals representing both oil and manufacturing firms spending hundreds of hours annually in improving the standards to keep them abreast of operating changes. At the moment, the most acute shortage of steel facing the industry is that of casing, and the API pipe committee has a new simplified listing of pipe sizes in its final stages of adoption that may go a long ways toward helping eliminate this difficulty.

It is impossible to estimate the value the industry has received from its standardization program, but there are many who think it the biggest single achievement of the industry. Unquestionably standardization has resulted in unbelievably large savings to both operators and manufacturers. For instance, in sucker rods alone, simplified specifications have reduced by one half the amount of bar stock necessary for manufacturers to carry. Those who were active in the industry prior to standardization can recall the chaos in the form of equipment waste, delay, mechanical difficulties and lack of operating latitude that existed. Fortunately for all today it is not necessary to tolerate the inefficient operating practices that were characteristic of the World War I era, and a large portion of the thanks that are due must be given to standardization progress.

The benefits of petroleum equipment standardization work goes beyond the scope of the industry itself, many having been adopted by other industries. At the moment it is interesting to know that the Army and Navy are requiring that much of the steel tankage it is constructing, whether for water or oil, conform to API specifications.

Standardization always receives big impetus during war times, when scarcities create demand for unified efficiencies, but the oil industry can boast of having made remarkable strides of this kind during the peaceful days between the two wars. So petroleum stands ready to assist in the current emergency without delays that otherwise would be necessary. It already has accomplished what many another industry must still do as a national defense measure.

Lead Requirements . . .

Decision of government purchasers to allow the use of 4 cubic centimeters rather than 3 cubic centimeters of tetraethyl lead in Army and Navy fuel has increased the nation's capacity to manufacture 100-octane aviation gasoline fuel from 1,800,000 gallons daily to about 2,100,000 gallons. Due to the scarcity of lead, this action is further proof that motorists may anticipate a reduction in the quantity of high-octane fuel that will be sold to the public.

Estimates of the 1942 and 1943 aviation gasoline requirements of the United States and friendly nations are being revised upwards so rapidly and so drastically that break-neck construction of large additional capacity is being started. As new plants are finished, they will require additional quantities of tetraethyl lead and thus further reduce the volume remaining for the motoring public, unless plans for enlarged lead production can be expanded rapidly enough to provide for the great increase requirements looming on the horizon.

Every development of late has indicated that public motorists will have to use lower quality gasolines before long.

Washington Roundup

Wartime control of all industry departments in California; Texas expects similar control . . . Revenue department abandons proposed change in tax deductions of drilling expense . . . Priorities regulations are liberalized

By B. F. LINZ, Washington Correspondent

WARTIME federal control of the oil industry, from producer to filling station, became an actuality this week with issuance by Coordinator Harold L. Ickes of a "recommendation" placing direction of California production under OPC, to be administered through the district industry committee.

Previously, OPC had assumed control of aviation gasoline production, in a recommendation paving the way for pooling of supplies and other steps to increase production.

The California order, however, was far more comprehensive, in that it provided for allowables for each field, pool and well. A "saving" clause in the recommendation, permitting conservation factors to be ignored in case of necessity, makes possible production at any rate required from fields furnishing oils of special grades which may be needed.

The order was seen as the forerunner of a similar recommendation for Texas, designed to increase the production of aviation crudes, and it was seen not unlikely that the scope of the government's control would gradually but rapidly be extended to all oil-producing states.

Under these orders, district committees would recommend production allowables for the various fields, possibly down to individual wells, which, upon approval by the coordinator, would be passed on to the state commissions for application in states having conservation laws and administered through the industry committees in states having no such legislation.

During the week, the producing branch of the industry learned that it had won a victory in its fight against proposed new Internal Revenue Bureau rules which would have eliminated the privilege of deducting intangible expenses incurred in the drilling of wells by independent contractors. A memorandum by the bureau's chief counsel reversed the proposed rules and maintained the procedure in effect before it was determined to follow the decision of the Board of Tax Appeals in the Retsal case.

California

Declaring that the California conservation situation has passed out of the realm of local interest into that of national concern, Coordinator Ickes on December 17 placed the industry of the state under federal control, prohibiting production in excess of allowables to be recommended by the industry production committee.

The order was an acceptance of the final draft of plans submitted by the committee to bring about maximum production without waste, and had been given the approval of the Department of Justice as not in contravention of the anti-trust statutes.

To the industry committee will be entrusted the responsibility of developing allowable productions for the California fields, and the order requires that persons engaged in the industry produce, store, sell, market, transport, purchase and handle only oil and its products produced in accordance with conditions proposed by the committee and approved by the coordinator.

The two objectives of the program are to enforce conservation on California and assure the Army and Navy an adequate supply of oil for the battle of the Pacific, Ickes declared.

"A conservation plan for California no longer is merely a question of local desirability," he said. "It has now become a matter of national necessity. California oil is indispensable for the war against Japan. Our success in supplying our armed forces in the Pacific depends upon the wisdom with which California oil production is operated.

"From the military point of view, this plan is essential. In addition to assuring our supply, it is urgently needed because of the dangers involved in having vast amounts of oil in storage on the surface. California's vital supplies of oil must be protected properly from enemy attack, sabotage, or other dangerous exposure, and this plan will make this possible.

"I am sure that the California oil industry will recognize the national responsibility that has come to it and will accept that responsibility."

While the plan is directed primarily at wasteful production of oil or gas, it contains a "saving" clause that where the coordinator finds that there is urgent direct defense demand for additional production from any particular California field the necessary production is to be provided.

In all other instances it is stipulated that "no plan shall provide that any field, pool or well produce at a rate in excess of the maximum rate at which it can be operated in accordance with recognized engineering practices and principles of conservation."

Under the order, the production committee for District No. 5 is instructed to take the following steps:

1. Assure the proper development, production and utilization of the reserves of petroleum and gas in the district.
2. Make petroleum and its products available at the proper places to meet military and civilian needs.
3. Secure the most effective use of critical materials.

4. Assure the efficient use of transportation, storage and refining facilities.

5. Eliminate the drilling of unnecessary wells.

6. Prevent physical waste above and under ground.

7. Assure that natural gas produced in conjunction with oil is used primarily for the efficient recovery of petroleum.

Specific Program

In a specific program laid down for the committee, it is required to encourage exploration with a view to discovering reserves at a rate not less than that by which known reserves are being depleted; to prepare plans for the orderly development of new fields or pools, including proper well-spacing practices and the consummation of unit or cooperative agreements for development, pressure maintenance or repressuring; and control drilling of new wells in proven areas so as to effect development with a minimum expenditure of critical materials.

In controlling production, the committee's plans are to be designed to prevent waste, both under and above ground, by limiting output to an amount sufficient to provide adequate stocks and fill current defense and civilian needs. Its allocation schedules under such plans are to be predicated upon such factors as gas-oil ratios; water production; regularity of water encroachment; maintenance of reservoir pressures; regularity of pressure pattern throughout the reservoir, and the maximum practicable ultimate recovery.

Production Control

In calculating rates of production for the various fields, pools and wells, the committee is to consider the kind and quality of oil produced in each in relation to current requirements; the availability of transportation; the effect of reducing rates of production on the continuity of output from any field, pool or well, and the maximum production for large wells and minimum production for small wells.

Production in excess of the amount scheduled is prohibited and will be subject to investigation by the committee, which will make a report to the coordinator. Any person affected by any plan, however, may obtain a hearing and a review before the committee and may appeal from its decision to the coordinator.

"The fifth district, bordering on the Pacific Ocean, is one of the areas most important in the national defense program and in the war effort," Ickes said in his order.

"The Army, Navy and defense industries are extremely active in this area and petroleum and petroleum products are prime necessities for each. The Pacific military and naval bases in Hawaii and Alaska, Western Canada and the entire area comprising the fifth district have been and must continue to be dependent upon petroleum and natural gas produced within the confines of the district, separated as they are from the other petroleum producing regions of the United States by the Rocky Mountains and lacking other adequate sources of fuel for heat, light, power and transportation. In order effectively to assure a continuing, ready and adequate supply of petroleum in this area to meet the needs of the national defense program, the war effort and essential civilian requirements, the development and production of petroleum and natural gas in District 5 must be so conducted as to assure not only an immediate but a continuous supply in adequate quantities for the duration of the national emergency.

"Many of the critical materials used in the discovery, development and production of petroleum are needed also in other phases of the national defense program and notwithstanding large increases in the demand for petroleum, such critical materials cannot be made available to the petroleum industry in as large quantities as they have in the past," he pointed out. "It is necessary, therefore, that all activities of the petroleum industry be conducted with a minimum use of critical materials and that the materials available be used in the most efficient and effective manner.

"In order to assure an adequate, continuing supply of petroleum and natural gas for the Fifth District, it is essential that development and production be at, but not greater than, a rate sufficient to provide adequate stocks and to fill current needs. The demand for petroleum and natural gas from the Fifth District can continue to be met only if the exploration, development and production of petroleum and natural gas therein are so coordinated as to effect maximum operating efficiency."

Protection

Protection of the oil fields of the country against sabotage is a responsibility of the civilian authorities and not of the Army, it was made clear this week in an exchange of telegrams between Senator Sheridan Downey of California and Lieutenant General J. L. DeWitt, commanding officer of the Ninth Corps Area.

The question of protection was raised by Thomas W. McManus of Bakersfield, Calif., chairman of the Oil Operators Committee, in a telegram to Downey advising he had wired Secretary of War Stimson requesting an armed guard in the California fields. The most valuable oil reserves in the west are in this county, McManus declared. "Many high-pressure wells exceed 10,100 feet. If any one well were sabotaged, escaping gas could destroy possibility of production from wells in an entire field. This irreplaceable loss would be most serious to our armed services. Principal gas supply furnished industry in Southern California comes from wells in this area. Industry believes it important that these key places be made military zones and that all people be denied access to these wells except those operating them. Very little protection given these vital properties at this time."

Expressing concern over the situation, Downey wired General DeWitt asking whether anything could be done and, in reply, was told that "It is the responsibility of the civilian authorities to guard such utilities and they have been and are being urged to do this. If the Army is forced to guard all utilities and activities essential to national defense there will be little left to perform military duties. Civilian authorities must be impressed with their responsibilities and urged to accomplish them."

Aviation Gasoline

The Supply Priorities and Allocations Board on December 16 approved the program developed last week by Coordinator Ickes to expand production of 100-octane aviation gasoline.

The plan calls for the boosting of productive capacity from 40,000 to 120,000 barrels a day by 1943, and with immediate increase to 44,000 barrels a day by the end of this year.

Details of the program were submitted to SPAB officials by the coordinator in a confidential memorandum outlining the present ca-

pacity for production, stocks on hand, expected demand for both the immediate future and for long-range needs and the methods by which it is proposed to meet that demand.

"The affirmative action taken by SPAB now clears the way for putting the full plan into effect and will assure necessary allocations for obtaining supplies and equipment needed for the construction program," it was declared by OPC.

The present productive situation, it was said, is "more favorable" than had been anticipated, and the work to be undertaken in the immediate future already has been outlined to oil company executives and their technical experts.

The first concrete step under the OPC aviation-gasoline program was announced December 20 with the working out of an agreement by representatives of Cities Service Company, Defense Supplies Corporation and Coordinator Ickes for a model contract for a new plant construction.

The agreement not only calls for an immediate start on a $2,000,000 plant in the Middle West but paves the way for completion of similar aviation gasoline contracts with several other refiners who will join the expansion program, it was said.

The contract provides for a loan by the government for part of the construction cost of the plant and for the purchase by the government of its entire output for at least three years. Contributing importantly to the expansion program, OPC officials said, was a recommendation by the Commissioner of Internal Revenue, permitting liberal depreciation for income tax during the life of the contract.

"The importance of the agreement lies in the fact that it makes it possible for refiners to undertake the large investments with some assurance of a market for a sufficient period of a product now chiefly used in war," it was explained.

"Perfection of contracts to enable American refiners to swing into production of the aviation fuel has been pushed by OPC. Consummation of the Cities Service contract opens the way to immediate execution of additional contracts by other concerns who are in a position to enter the business."

It was pointed out that the aviation-gasoline needs of the Allies will necessitate a tremendous expansion of this country's facilities, already producing more 100-octane gasoline than the rest of the world combined, and that plant expansions already under construction or ready to go will cost up to $150,000,000.

Construction of the world's largest gas cycling plant will be undertaken immediately in Texas as another step in the OPC program, it was also announced.

More than $3,000,000 will be invested in a plant in the Katy gas field of Waller County, Texas, capable of processing 275,000,000 cubic feet of gas daily with a yield of nearly 7500 barrels of combined distillate, kerosene, naphtha, natural gasoline, butane and iso-butane. A preference rating of A-1-A has been given by OPM at the recommendation of the coordinator.

The plant is to be operated by Humble Oil & Refining Company, and besides the processing plant, the preference rating covers material and equipment for the drilling of eight additional gas wells and construction of a 46-mile 4-inch gasoline pipe line. Originally designed to recover only 50 percent of the available butanes, the setup was redesigned at the suggestion of OPC to recover 80 percent.

The Katy field is completely unitized and will be operated conservatively, on a basis of less than three percent yearly withdrawal of available condensates and butanes. After processing, the gas will be returned to the formations for pressure maintenance. It is estimated the reserves of condensate and butane in place amount to 102,000,000 barrels, of which the new plant ultimately will recover 75 percent.

Tetraethyl Lead

Definite indications that the OPM would go through with its program to reduce the use of lead in gasoline were given in a challenge by OPA of industry contentions that reduction of the octane rating of regular gasoline from 75 to 70 percent would reduce gasoline mileage by as much as 10 percent and cost motorists an additional $250,000,000 a year.

OPA engineers contended that only a few of the latest models require 75-octane gasoline and that motorists are "wasting millions of dollars every year in burning higher-grade gasolines than are required by their cars."

In most cases nothing more than a simple and inexpensive change in timing would be required to eliminate objectionable knocking on 70-octane fuel, it was asserted.

"Our tanks and military planes will require large quantities of gasoline with high octane ratings," OPA said. "This means that there will be a heavy war demand for high-grade gasoline and the tetraethyl lead used to increase octane, or anti-knock quality, in gasoline.

"In addition two materials, chlorine and lead, used in the manufacture of tetraethyl lead are scarce, being in wide demand for essential military or other defense uses.

"A slight amount of 'pinging' on rapid acceleration or under heavy loads on hills is not harmful to a car."

Conservation

Enactment of a petroleum conservation law should be a major feature of any program laid before the Illinois legislature if a special session is held, as planned by Governor Green, that official was told by Coordinator Ickes.

"There is no item in our whole national economy that is of more importance in the matter of defense than oil, and the wasteful production of its is something that all good citizens should combine to prevent," Ickes declared.

The telegram went no further than to urge that legislation be enacted, but there were indications that if Illinois failed to take the hint and the coordinator was vested with wartime powers over production, that state would be the first target of official action.

Waste

Membership of the special subcommittee set up last week by the executive committee of the industry council to work out a program for the prevention of waste in the consumption of gasoline and oil has been announced by Chairman W. R. Boyd, Jr., as follows:

W. Alton Jones, president of Cities Service Company, New York, chairman; W. S. S. Rodgers, president of The Texas Company, New York; J. Frank Drake, President of Gulf Oil Corporation, Pittsburgh; William F. Humphrey, president of Tide Water Associated Oil Company, San Francisco, and T. H. Barton, president of Lion Oil & Refining Company, El Dorado, Arkansas.

Power Shortages

With defense-industry demands for electric power far in excess of productive capacity, shortages of current were forecast for many sections of the country during the coming two years in a survey just

completed by the Office of Production Management.

Publishing the results of its studies, OPM warned December 21 that new shortages are to be expected in the southeastern states which suffered deficiencies of rainfall last summer and fall, and that shortages also are foreseen in Texas, Arkansas and Louisiana; Buffalo and St. Louis, and in the Pacific Northwest.

To meet the demands of the defense industries it will be necessary not only to pool utilities in a wide area surrounding the affected sections but also to impose restrictions on non-essential consumption of current, including the blackout of all exterior and advertising illumination.

Carbon Black

Carbon black producers were given a measure of relief by the Office of Price Administration December 17 in the form of an order permitting an increase of slightly less than 5 percent in prices.

OPA explained that three large and 14 smaller companies engaged in the production of carbon black from natural gas have been handicapped by cost increases beyond the point where they could be absorbed in the relatively depressed state of the industry, while revenue from export sales also has been reduced.

The new prices will become effective on deliveries made beginning January 1 and will be 3.3 cents per pound for ordinary carbon black in bulk, 3.55 cents in bags, compressed or dustless, and 3.625 cents in light bags, suitable for ink or paint.

Appointments

New appointments to the industry committees were announced December 18 by the OPC as follows:

District 2 Transportation Committee: C. H. Kountz, vice president of Sinclair Refining Company, Independence, Kansas, and Charles Bunje, Jr., president of Illinois Pipe Line Company, Findlay, Ohio.

District 3 Refining Committee: Dr. R. H. Waser, Shell Oil Company, Houston, Texas.

District 4 Refining Committee: E. M. Parkin, superintendent of Glacier Production Company refinery at Cut Bank, Montana, succeeding F. W. Bird, president of that company, resigned.

Drilling Costs

The long-awaited Internal Revenue Bureau decision on the deductions of intangible drilling costs incurred by oil operators under contracts for the drilling of wells by independent contractors was issued by the bureau December 17, restoring the former procedure of permitting the deductions which under the Retsal decision the Board of Tax Appeals had ruled could not be taken.

The opinion prepared by J. P. Wenchel, chief counsel of the bureau, held that payments to a contractor under a turnkey contract are capital expenditures, even though the contract may also be a footage contract.

Costs incurred by operators under a footage contract which is not also a turnkey contract were held to represent intangible drilling and development costs which may be charged to expense under the option granted in the Internal Revenue Code.

Payments to a contractor under a contract that is neither a turnkey nor a footage contract are held to be capital expenditures if the contractor is an independent contractor, but may be charged to expense under the option if the contractor is an employee or agent of the operator rather than an independent contractor.

All intangible drilling and development costs incurred in drilling and development carried on by operators through employes or agents are within the option.

The ruling, which in effect permits the deduction of intangible expenses on wells drilled by contractors, except where the contractor furnishes all materials and labor, was said to be satisfactory to the operators, heading off action threatened by Senator Tom Connally of Texas to incorporate a specific provision for such deductions in the tax bill which is to come before Congress next month.

The allowance of these deductions was intended to be excluded in a new ruling prepared by the bureau in October, based on the decision of the Board of Tax Appeals in October, 1940, holding that Retsal Drilling Company was not entitled to deduct as intangible drilling and development costs any portion of the amounts paid to drilling contractors under agreements for the drilling of wells at fixed prices, incurred in the furnishing of some of the supplies required for drilling operations, some of the items of equipment, or the furnishing of a man to supervise the drilling and the running of the casing.

Members of the industry immediately protested the proposed new rules, and a hearing was held before bureau officials November 3, at which it was testified the Board of Tax Appeals decision, if followed, would force most of the independent drilling contractors out of business and make it difficult for any but the largest oil operators to continue depevelopment activities.

The operators were supported by OPC, with Robert Allen, director of production, testifying that the resulting situation would be serious, adversely affecting the national defense program.

Priorities

Revision of the repair and maintenance order, P-22, under which provision was made for priority on materials needed for the repair, maintenance and operation of drilling and producing equipment, was announced by OPM December 18 in issuance of a new order to be known as Preference Rating Order P-100.

The new order is more liberal, lifting from 100 to 110 percent of the maximum dollar volume a year ago the amount of materials which may be carried on inventory by producers using the order.

The change was made to allow for price increases, it was explained, and for the same reason the restriction on withdrawals from inventory or stores has been raised to 110 percent of the aggregate dollar volume of such withdrawals in the corresponding quarter of 1940 or, at the producer's option, up to 27½ percent of the total withdrawals for the entire year.

Imports

With imports of oil from Venezuela under the trade agreement almost at their quota level, the Treasury on December 19 ordered entries after December 21 held up pending a final determination of the quota status. The department said that Venezuelan imports up to December 6 totaled 1,807,909,065 gallons out of a quota of 1,913,049,600 gallons. If release of any Venezuelan oil is desired after December 21 and before the department's determination of its status, estimated duties at the full rate must be deposited, to be returned on oil found to be within the quota.

A Few Comments On

Ickes' War Assignment

LAST week we published a letter from Petroleum Coordinator Harold L. Ickes, replying to one addressed to him by Ray L. Dudley, publisher of THE OIL WEEKLY. The letter from Secretary Ickes was received too late to include comment on it in last week's issue.

As readers well know, this publication has been outspoken in criticism of the Coordinator on more than one occasion, although the letter of its publisher to Ickes on November 12 was addressed in a friendly tone.

This friendly tone was fully matched by Ickes and if his letter in reply, dated December 9, may be taken as evidence of his attitude toward the oil industry—and we believe it may be so taken—it is our belief that the industry is faced with an opportunity for real and efficient cooperation with the man named by the President as the Coordinator of Petroleum.

The Coordinator's approach to the questions asked him was straightforward and to the point and while some of the questions cannot be answered at this time because basic data are still in process of preparation, the very fact that such data are and have been in preparation is most reassuring.

In his comments on the necessity of increased production from present wells, we find ourselves in full agreement. And likewise with his opinion that physical waste or damaging of ultimate recoveries should not be contemplated, if the oil can be obtained in any other way.

The Coordinator states wildcatting should be increased, but that too much dependence should not be placed upon the returns from wildcat tests. He explains this by saying 30,000 wells annually would suffice if the productivity rate witnessed in recent years is maintained, but that 15,000 above-average wells might do the trick, whereas 45,000 below-average wells might be necessary. This is certainly true, and wildcat locations should be selected carefully.

With what Ickes had to say about potentials, we are in hearty agreement as there has seemed to us to be no valid reason why the states cannot get together on a potential measurement which would be more in accord with the facts than past potential measurements have been. The idea that Kansas, for instance, has an actual potential of several million barrels daily is thoroughly absurd. That Kansas can increase production we may all reasonably accept, but a system of taking potentials which produce figures the oil industry knows are ridiculous and extremely misleading to the public, can work to no good end.

At this point, we believe an assignment can be made to the Interstate Oil Compact Commission—an assignment to produce a potential-taking system which has a uniform meaning throughout all of the oil-producing states. We agree with Ickes that the word "potential" has been so misused that it might well be abandoned and a term not in such disrepute be substituted.

With reference to the prospective demand for the coming year we realize the Secretary is right when he says that it cannot be predicted to a great degree of accuracy nor can the industry expect more than a minimum assignment at this time. He gave us that minimum assignment, which we suspect will be increased shortly.

With reference to equipment, this is an increasingly pressing question. The Coordinator points out that his office has specifically requested the Supply Priorities and Allocation Board to allot the petroleum industry 5,400,000 tons of steel and other materials for 1942. We are not familiar with the system with which a ratio is obtained between oil to be produced and pounds of steel to be used nor are we definitely informed as to the amount of steel consumed during 1941. We do know that there are years termed "lag" years in the purchase of equipment and that these "lag" years, although they may run successively for two or three years, are invariably followed by years of necessary heavy buying. We are afraid that the record will show that 1941 and 1940 were "lag" years, the last heavy-buying years being in 1936 and 1937. This is occasioned by the fact that equipment lasts longer than the year in which it is bought.

THE OIL WEEKLY is preparing an estimate on the number of wells which will likely go on the pump in 1942. An equipment shortage would mean many of these wells may be equipped at the expense of less productive wells. Consequently, the Petroleum Coordinator is eminently correct when he intimates that every possible method should be followed to extend the life of equipment in use.

In his letter the Coordinator points out that the publisher of THE OIL WEEKLY failed to refer to need for additional refinery and transportation equipment. His point is well taken and possibilities lie ahead of us which might easily require immediate construction of an additional half-million barrels of refining capacity per annum.

We find the Coordinator in agreement with our previously expressed thought that above-ground petroleum stocks should be increased due to current conditions.

Answering a question in which the publisher asked the Coordinator to specify just where physical waste is occurring, he deals with materials rather than physical waste of oil in his reply. He touches on the waste of natural gas when he says that he realizes also that the waste of a commodity is frequently inversely proportional to its value, which may account for the continued waste of natural gas in some areas, the value of which for increasing oil recovery may not be fully appreciated.

This is a most moderate statement for a man who has been so emphatic in his denunciation of gas waste. He has put his finger on the reason for most gas waste. He does not excuse it, but he does recognize that the matter is one of education. In this we are in thorough accord.

His assignments to the industry are clean-cut, practical and necessary. There have been several comments on the tone of the Petroleum Coordinator's letter, and universal satisfaction has been expressed.

Resleeving box end of tool joint after setting split shoes into turned grooves in worn joint. Copper-faced clamp provides face against which new elevator shoulder is built up and annulus between shoes is brought to common surface by welder. Chill ring helps dissipate heat and protect drill pipe thread from possible distortion.

Improved Rebuilding Methods

Extending Tool-Joint Life

By ELTON STERRETT, Staff Writer

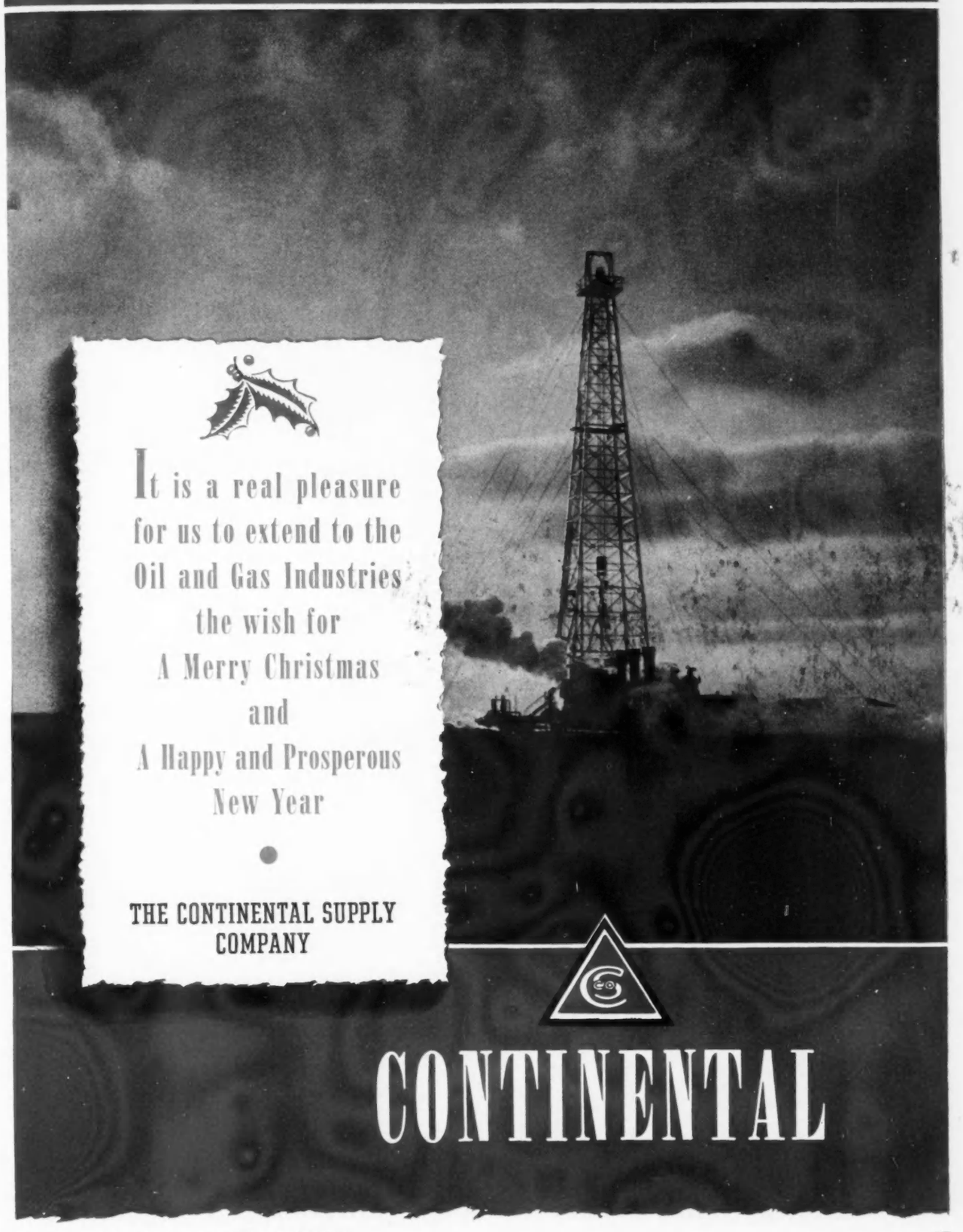
AT NO TIME in the history of rotary drilling has the demand for drilling equipment been more insistent, nor the facilities for supplying the demand more hampered and restricted. Priorities, steel shortages, transportation bottlenecks, all combine to make the delivery of equipment to the rig more and more uncertain, against which there stands an increased need for drilling which promises to make 1942 a record year both in wildcatting and in developing proven territory.

To keep present equipment running and to meet the stepped-up demand, every means whereby longer equipment life may be obtained is sure of a trial. In transmitting power from the rotary table to the bit, improved methods and a wider understanding of drill-pipe functions have led to extensions of pipe service many times that formerly believed possible. It is the tool joints which seem to be lagging in the endurance race, but advancements of note have been made in this phase recently.

With thread failures cut to a minimum through careful running, proper doping, and thorough tonging, it is on the outer surface of the joint that failure first marks the unit for the scrap heap. This does not, of course, apply to external flush pipe, in which there is no outside diametrical difference between pipe and joint, but does apply, with varying degrees of gravity, to all types of pipe having the joint of greater diameter than the shank of the pipe itself.

Where the tool joint is of the conventional type, affording within itself added metal for the joint, and carrying elevator shoulders of either the streamlined or square type, the larger joint takes the combined grief of rotary abrasion through contact with the sides of the hole and the amplified scouring or scarifying effect of formation particles and cuttings being forced through the constricted annulus by the flushing mud stream.

Serving the Oil and Gas Industries



It is a real pleasure
for us to extend to the
Oil and Gas Industries
the wish for
A Merry Christmas
and
A Happy and Prosperous
New Year

THE CONTINENTAL SUPPLY
COMPANY

CONTINENTAL

Combined hard-facing and rebuilding operation on tool joints by application of circumferential hard-facing and longitudinal high-carbon beads. Joints run in the hole in this condition eventually wear smooth, but must be checked carefully for spotting tongs to insure proper grip on corrugated surface.

Understanding of these factors combining to wear away the tool joint from the outside is not new. Rubber protectors, if kept as close as practicable to the upper edge of the joint, have sufficient overhang to take the contact and absorb the rotary grinding effect of the formation. But, due to elevator requirements, it is impossible to run the protector immediately below the joint, and there to fend off or divert the scouring effect of the high-velocity mud stream. Where this scouring is the predominating cause of wear, the scratches on the tool joints are all parallel to the bore, and show none of the circumferential or spiral effect noted when a joint is run and worn at high speed in contact with an abrasive formation.

Reconditioning Methods

Since steel shortage and deferred priorities have entered into the equipment renewal problem, methods of reclaiming, rebuilding and treating tool joints are possible solutions to any shortage which may occur in supplies of joints for replacement use.

A joint in a 4½-inch drill string under certain drilling conditions is considered as having suffered maximum safe reduction in cross-sectional area if the diameter of the outer surface has been reduced by ⅛-inch, or if the wear, assuming uniform attrition, is 0.1875 inch. Below this margin, the joint is a potential location of failure through splitting or swelling when torque exceeds the normal safe amount for the type of string being run.

The amount to be built up, being only 3/16-inch in thickness, lies well within the practicable working limits of a single bead with ¼-inch welding rod. Usual practice is to apply circumferential beads at both ends of the tool joint, as a rolling weld, using a copper chill ring if the elevator shoulder is cut away enough to require more building up than can be obtained by a single bead. With the two ends thus brought out to size or slightly in excess of the original nominal diameter of the joint, longitudinal beads are laid up from end to end of the joint until an entirely new surface is completed. To prevent spatter or damage to the pin threads, they are covered by a thread protector before beginning the welding. Possible distortion of the threads is also minimized by using copper chill rings at both ends of the job during welding.

The ridges left on the tool joint by the parallel series of beads are not detrimental to tool joint wear, the abrasion in service tending to grind the surface again to a true cylinder. Tonging, especially the first few runs of the pipe, is appreciably slowed down, it being necessary to engage the tongs carefully to prevent slippage and consequent breakage if the die engage on top of one of the bead ridges.

When hard-facing material is used in conjunction with the usual high-carbon rods used for such a rebuilding job, it is customary to build up the ends with the hard facing, extending the width of the band covered by the circumferential bands from the width of at most two beads to as much as one inch.

Tool joints built up in this manner, and without special hard facing materials, may be turned to size if necessary, and are then theoretically capable of delivering as much more footage as when first turned out, if normalized or heat treated. Subsequent rebuildings are theoretically possible, though unless especial care is taken to preserve the contour and concentricity of the threaded portions, tendency toward thread failure sets as prob-

IN Olean, New York, and London, England . . . . in Boston and Buenos Aires . . . . in New York City, Chicago, Tulsa, Houston and Huntington Park — in short, wherever Clark men live and serve—there is a candle burning today in your honor. It symbolizes the faith and the spirit of the Christmas season and expresses a wish in which every Clark man joins—the wish that you and yours may enjoy, in 1942, a full measure of health, happiness and prosperity.

Clark Bros Co.

Resleeved joint with hard-faced shoulder and wear band after drilling 18,000 feet of hole. Slight undercutting of hard-faced band is evident, and elevators have combined with formation wear to smooth shoulder. Nicks caused by drill steel and hard formation evident in edge of facing do not affect life of rebuilding job.

able limit the discarding of the joint after doubling the initial amount of hole made.

"Half-soling" the tool joint, patterned after the principle in which pitted or corroded pipe joints are reclaimed, is also resorted to in building up worn joints. Bands are turned from the worn joint, and clips of high-carbon steel, formed to fit these turned sections, are cut diametrically and fitted between the lands thus formed. These clips or shoes are then welded around all exposed edges, the gaps formed by splitting the bands filled with metal, and the annular groove between the bands brought out to diameter.

It is not customary to rebuild the entire surface of the tool joint with "half-sole" clips, as it is built up by welding on beads, but instead enough of the old joint is left so that, by careful spotting, tongs may still be applied to the old surface. This method permits use of hard-faced bands in the outer or both of the lands and provision is thus obtained against excessive circumferential wear.

Eccentricity

Any tool joint, before reconditioning, should be checked for eccentricity and discarded as unsuitable if found to be more than 0.05-inch out of round from use on crooked pipe. This eccentricity may best be determined by spinning the joint in a lathe or between centers, in which the actual joint support is obtained through jaws gripping the threads, or special threaded fittings into which the pin, box or double ends fit accurately. Bearing face width variation is also a true indication of this condition.

In the field, it is not sufficient to check the joint against the contour of the drill pipe with which it has been run. Usually the eccentricity is apparent if a steel scale be laid alongside the joint and extended out over the drill pipe at several points around the circumference, but if the pipe itself be out of round, the error may be either minimized or doubled. For a check close enough to determine the advisability of reworking a joint, it is necessary only to buck it into a joint of new drill pipe and to check parallelism of its diameter with the pipe shank. Any joint which shows the effect of one-sided wear under this test probably will continue to wear as before, even with new outer or contact surface.

The determination of possible eccentricity is of much greater importance when using the "half-sole" method than when building up the surface with welded-on beads. An eccentric joint, carrying bands of uniform thickness, tends to wear away the band on but one side, with eventual loosening or splitting of the band, which then works loose and may cause serious trouble at points down the hole.

Joints which have worn down to the prescribed limit may also be reconditioned by turning the worn end to a specified close tolerance, and then shrinking a prefabricated sleeve onto the joint. The sleeve is formed with a lip or overhang which covers the end of the tool joint itself, and forms an effective hydraulic seal against further cutting of the joint metal at the spot where it has been turned down. The

Stoody Process DOUBLES Tool Joint Life

The Bryson, Texas area is tough on tool joints—so tough in fact that unprotected joints are usually retired after drilling only 18,000 feet of hole.

In January of 1941 a contractor in this area rebuilt a string of worn integral joints with high carbon and then hard-faced the wearing surfaces with Coated Stoody Self-Hardening. This string has now drilled between 24,000 and 25,000 feet of hole and is still good for several additional wells. Tool joint life has been increased 150% and by the time the hard metal deposits are completely worn away will approximate 200%. Material costs were less than four dollars per joint.

If tool joint wear is your problem, you can reduce drilling costs and at the same time *conserve your precious steel supply* by coating the wearing surfaces of tool joints with either Electric Tube Borium or Coated Stoody Self-Hardening.

A Stoody Service Engineer will be glad to call at your convenience and show you how to apply Stoody alloys in order to get maximum service.

STOODY COMPANY, 1134 W. SLAUSON AVE., WHITTIER, CALIFORNIA

STOODY COMPANY *Hard Facing Alloys*

Hard-facing tool joints with comparatively wide face of self-hardening deposit. Copper end plate is used in making this repair to insure square elevator shoulder. Careful tong spotting is necessary to avoid gripping corner of die on hard-facing metal, but ample tong area is left above three-inch hard band.

upper end of the shrink sleeve—that toward the center of the tool joint—is welded to the joint and a slight shoulder formed there, tending to reduce scour at that point.

Worn sleeves may be replaced with new ones by simply cutting off the old sleeve with a torch much as a worn tool joint is cut from good drill pipe.

By using sleeves which extend only as far up the tool joint as the threaded portion, sufficient area of the original joint is left for effective stabbing of the tongs without time lost for close spotting.

Another type of resurfacing the joint involves the use of a spiral wrapping of steel, applied after the worn joint has been turned to a uniform diameter. The spiral begins close to the shoulder, and renews the entire tool-joint surface, the spiral-vee groove formed by abutting edges of the spiral being filled with welded metal of the same composition as the strip. The ends are likewise squared up by welding, and the joint turned to size if hole clearances are minimum, or left as welded to wear true in service.

These strips, building up the joint to its initial diameter, may be replaced when worn by again turning the sub in a lathe, to remove the spiralled welding bead by which the wrapping was applied, and resurfacing as before. Precautions for protecting the pin thread from spatter should be observed here as on other similar welding repairs.

Hard Facing

From the point of view of endurance in the hole, a tool joint completely covered with or en-

Merry Christmas

More than 200 members of the Hunt Tool Company office, shop and field staffs take this means of extending the Season's Greetings to their thousands of friends throughout the oil fields of the world.

HUNT TOOL COMPANY

Original tool joints extended by adding facing washer of tool-joint steel and building up annulus with carbon steel filler and hard-facing wear ring. Facing washer takes elevator wear and serves as baffle for mud stream, protecting hard facing from undercutting.

cased in hard-facing metal is ideal. It is possible to design and construct such a joint which will retain its original diameter over runs several times that obtainable from 3140 steel under like drilling conditions. Such a tool joint, however, is so expensive that the cost is usually as many times that of the plain joint as are the relative service lives, and no cost gain is attained.

Such a tool joint, also, is expensive in rig time. Tonging on a joint entirely covered with hard-facing metal is expensive in tong die replacements, and each engagement of the tong must be made slowly and carefully to insure against slippage and possible serious equipment damage. By reason of the difficulty in tonging, and thus insuring tight connections, thread troubles are apt to cause discard of the tool joint long before its surface life has been exhausted.

Combinations of hard facing and built-up joints in which all but the hard band are of steel approximating in analysis that of the original tool joint may be balanced in design so that they will give maximum life and minimum rig troubles.

The erosive action of the grit-laden mud stream is greatest at the bottom or elevator shoulder of the tool joint, and most methods of combating this erosive effect and the added abrasive wear of the formation call for applying hard metal at or near this point. If the shoulder be cut away to an extent where a single bead will not bring it again to diameter, carbon rods are used to bring the diameter out to where not more than ⅛-inch of hard-facing metal is required. Thinner coatings of hard-facing metal have proven effective in reducing circumferential wear, but tend to be undercut by the mud stream, the high-velocity fluid cutting the softer backing metal away from under the surfacing, and exposing it to the hammer-like blows of irregularities in the formation and ultimate fracture.

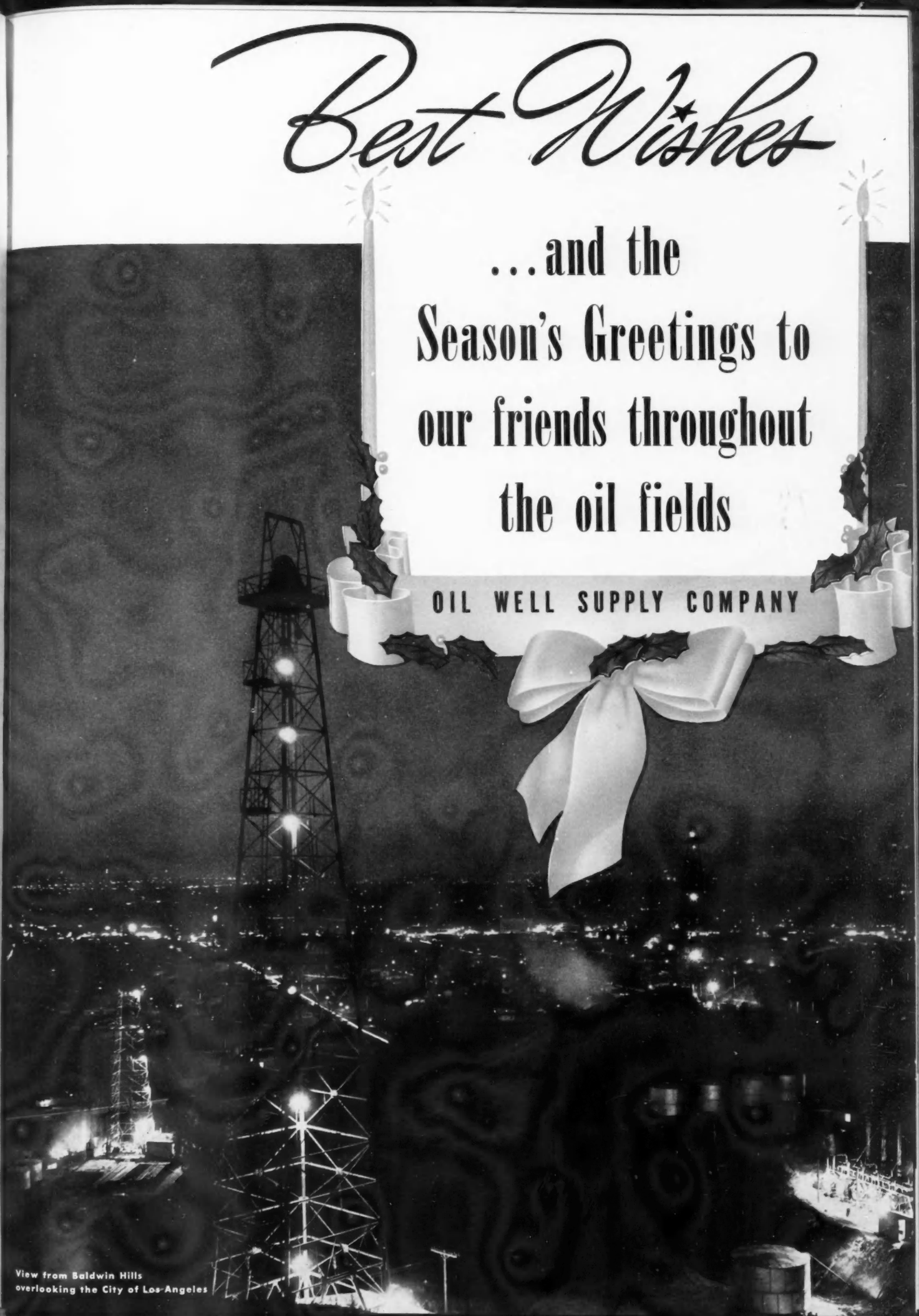
Width of the hard-facing bands varies with individual operators and in different types of formations from a minimum of 5/8-inch to as much as 3 inches, with ⅛-inch the most common thickness regardless of the lateral extent of the band. Cost is roughly proportional to the width, although operating results do not follow the same ratio. One set of tool joints, hard-faced with a tungsten carbide band ¾-inch in width, were so close to original diameter after 24,000 feet in all rock-bit drilling that it was impossible to detect wear when checking initial calipering—in which the roughnesses of the coating were evaluated as closely as possible so as not to create erroneous initial diameters—against that taken at the end of the test run. The hard-faced bands in this run were used as formed by the welder between lands on the joints, and were built up so as to be flush with or slightly projecting from the normal face of the joint. No attempt was made to protect the metal of the joint itself by overhang of the hard facing. The figures presented at the end of the run do not include any data on the original or ultimate diameters of the joint, but cover only hard metal dimensions. The string was 4½-inch pipe, with close weight control and open hole from the surface string to completion.

Elevator Shoulders

Maximum erosion coming at the elevator shoulder, especially when this is of the square or 90-degree type as differentiated from the streamlined shoulders requiring specially formed elevators, rebuilding of tool joints and hard facing often includes the renewal of the flat shoulder as well as the cylindrical section.

Various methods have been worked out for attaining this result; none of which has proven so generally superior as to eliminate the others. Use of a copper mold or chill ring, clamped around the drill pipe at a distance of from ⅛- to as much as ½-inch from the end of the tool joint when bucked onto the pipe with specified torque, enables the welder to build up a shoulder of whatever composition is desired, although it is not possible to make all types of hard-facing metals build up satisfactorily against the copper.

Using the ring, the inner portion of the repair need not be of hard-facing metal, but will give better results if of mild steel, followed by high-carbon rod, and with only wearing surfaces of hard facing


Best Wishes
...and the
Season's Greetings to
our friends throughout
the oil fields
OIL WELL SUPPLY COMPANY
View from Baldwin Hills
overlooking the City of Los Angeles

Wear sub as run in string, with reduced area of soft metal clearly showing below hard-faced band. This sub has been used for more than 70,000 feet of hole, and was only ⅜-inch larger in diameter than tool joint at beginning of run. String may be broken either above or below sub, dividing thread wear in half.

rod. Where it is desired to carry the elevator shoulder itself in hard-facing metal, one operator reports success in using a thin washer or backing ring of 3140 steel just inside the copper chill ring, completing the weld in the groove or vee thus formed by the backing ring and abraded surface of the tool joint. Here, again, less expensive metal is used for building up the filler portion of the reclaiming operation, with hard facing being laid down along the washer to a thickness of ⅛-inch, and a hard facing then carried around the corner and out along the cylindrical portion of the joint for a distance of 1¼ inches. Apart from a few minor nicks where fragments of bit steel and other exceedingly hard materials being brought up from bottom had chipped the 90-degree shoulder, the strings showed no visible wear when checked after making 18,000 feet of hole, mostly in rock-bit formations.

Another operator, desiring to keep the hard-faced band away from actual contact with the elevator shoulders, used a ¼-inch washer or wear band of 3140 steel, cut from ordinary tool-joint stock as back-up for the welding job. The washer is slipped on the drill pipe prior to bucking on the joint, and clamped at a distance of 1⅛-inch from the end of the joint when in final position. The bottom of the rectangular groove thus formed by back-up washer, drill pipe and end of tool joint is then filled in with high-carbon welding rod to within ⅛-inch of the desired diameter, and 30-screen tube tungsten carbide used to form a hard-facing ring. In this type of rebuilding, the hard-faced ring is not a part of the original tool-joint length, but is added on below it, extending the joint length by the amount of the band without cutting down on the amount of tool joint originally afforded for tong use.

Although the original tool joints used in this string were streamlined or boat-tailed by the effect of the mud stream, sufficient running hours have not yet been piled up to determine the effect of the sudden change in mud direction after the scant ¼-inch of temporary protection afforded by the 3140 steel collar has been scoured off. It is believed that the depth of the hard facing will be sufficient to intercept the stream and effect the change without serious effect on the metal below the band. If the softer metal below the band does erode, however, all the weight of the string in the hole will tend to be concentrated on the narrow edge or side face of the hard metal, with possibly aggravated elevator wear.

Wear Subs

The tendency in drill string practice has been to reduce the number of threaded joints per string, through such expedients as joints integrally combined with the pipe, flash-welded thereto in the tool-joint factory[1] or made in effect a part of the pipe through such complete welded junction as is effected by the shoulder build-up just described. When any of these methods is used, all thread wear is concentrated on the box and pin of the tool joint, and thribbles in the well are broken at various points as the string is pulled so as to distribute this service over all the joints in the string.

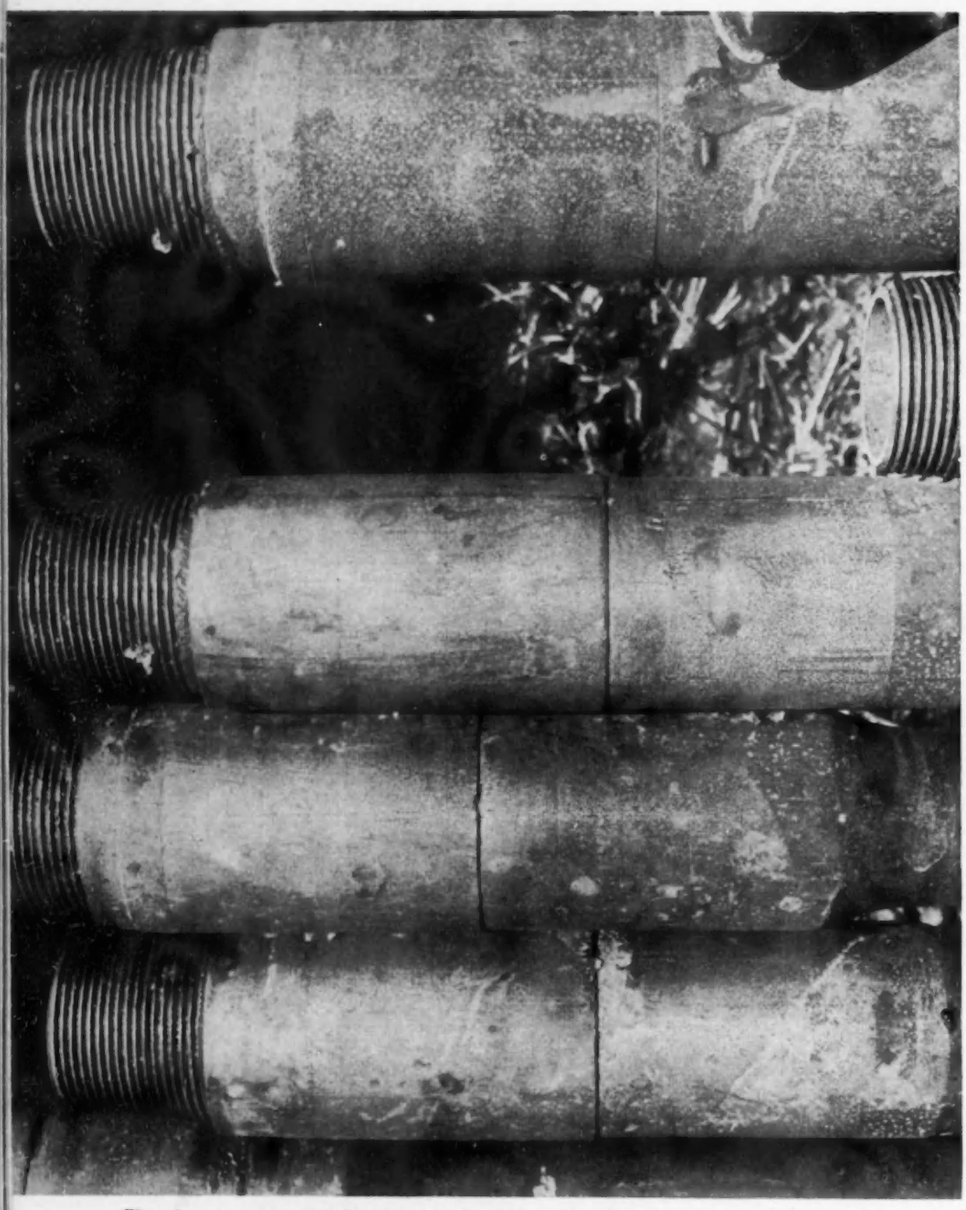
To divide this thread wear, wear subs were designed and introduced,[2] primarily with the purpose of providing the driller with two sets of tool-joint threads at each pipe junction so as to afford double thread wear. Since this method also doubled the number of joints which

Merry Christmas and a Happy New Year

from

THE LARKINS

Jim Bill John



The bottom and third subs are flame-hardened throughout, while numbers two and four are fitted with hard-faced bands and clearly show erosion of tool joint land below facing band. These wear subs all have a service record of over 70,000 feet of Gulf Coast drilling, and still show diameters in excess of original worn tool joints which they protect.

had to be kept tight, wear subs soon lost favor.

Where circumferential wear is the limiting factor in tool-joint life, wear subs have again been called into service. Wear subs, 10 or 12 inches in length, are made ⅜-inch larger in diameter than the tool joints with which they are to run. This excess diameter affords metal which takes the brunt of the formation wear, and which requires the replacement of an item weighing and costing but one third of the tool joint which it protects. And, with the reduction in tool-joint-surface wear there again comes the gain in having two sets of threaded surfaces to divide the wear. To reverse, it is necessary only to break out at the top of the sub instead of below, and thus to reverse the wear by carrying the subs on top of the thribbles instead of below them.

With wear subs again in the picture, it was natural that they should be regarded as ideal location for hard facing. Annulus clearances being small, wear subs could not greatly exceed tool joints in diameter without seriously restricting mud flow and at the same time speeding up the velocity of the grit-laden stream and thus increasing the effectiveness of its abrasive effect against any change in diameter of the pipe string.

One operator, checking the joints on a string of pipe which had drilled 90,000 feet of hole in Gulf Coast deep drilling, found the average joint diameter reduced by ⅜-inch, which in his opinion classified the joints as at minimum safe diameter, though careful examination of the string otherwise showed the pipe itself good for many more thousands of feet of hole.

The string was fitted with wear subs, turned to original tool-joint size from salvaged drill collars, without heat-treating or normalizing. These wear subs, when completed, were 6⅛-inches in diameter and of the usual box-and-pin type, being run pin end down as customary with the string before introduction of the subs.

The subs were split into two lots, 185 being sent to the shop for fitting with a hard-faced band, the other 50 being flame-hardened throughout. The hard-facing metal was applied in a band ⅛ x 1⅛ inches, being laid into a groove or land cut into the tool joint stock on a lathe. The metal was tungsten carbide, built up to the face of the sub, but not above it. Care was taken to fill the band completely, but no attempt was made to hold the surface of the hard band itself within close limits of circularity. Checks at many points across the joint at the wear band showed practically continuous surfaces, the wear sub being cylindrical except for slight 45-degree relief bevels turned at both ends to avoid presenting sharp corners to the mud stream.

The string was run for 28,000 feet of hole and the subs then checked for wear. It was immediately noted that the shoulder of tool-joint material below the hard-faced band had been cut almost entirely away by wear in the hole, leaving the lower edge of the band itself as the actual surface opposed to the mud flow. The subs were checked over the band, in the middle and close to the ends. Wear was averaged and found to be 0.0791 inch on the hard-faced subs, with the band of hard-faced metal standing out from the sub like a copper band on a shell.

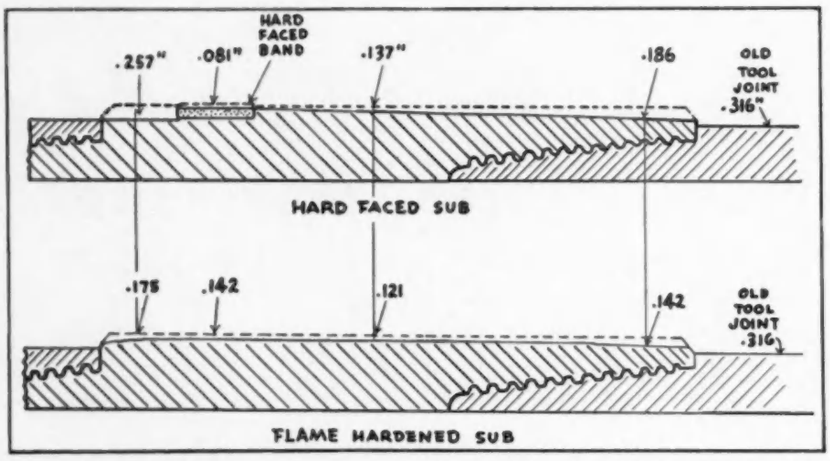
Again run into the hole, the service life of the string with the wear subs was extended to 65,000 feet of hole, and the subs again

WHO-O-O-A BLITZEN!

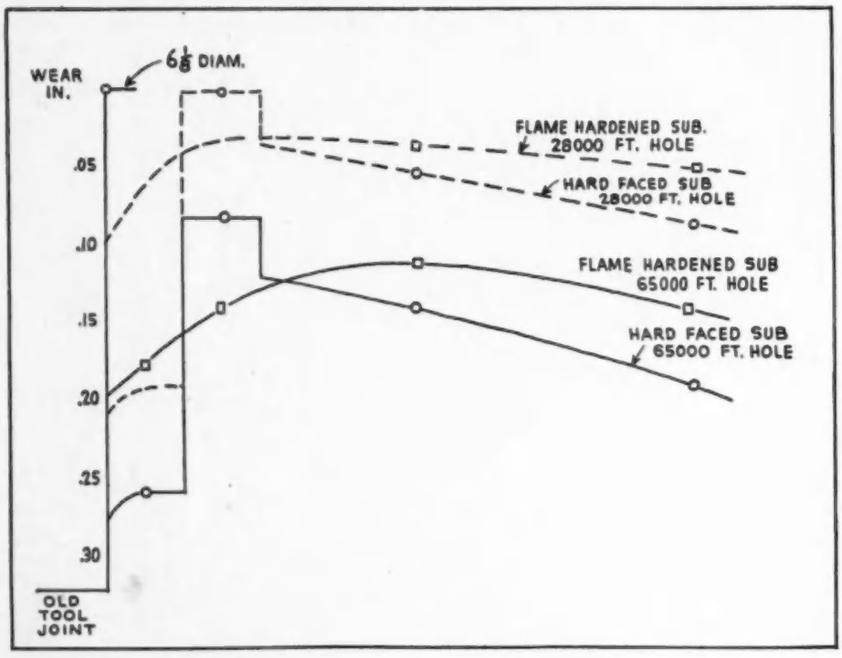
THIS IS WHERE THE O•C•T FOLKS ASKED ME TO STOP AND SAY TO EVERYBODY – EVERYWHERE:

"MERRY CHRISTMAS"

OIL CENTER TOOL COMPANY • HOUSTON, TEXAS, U•S•A



Above: Typical calibrations on wear subs after drilling 65,000 feet of hole, with all dimensions reading minus diameters, as measured on diameter of sub before running. Figures show actual wear at points indicated. Below: Exaggerated wear curves of averages on flame-hardened and band hard-faced wear subs, wear being measured from initial diameter of sub before running.



checked. At this time the average wear over the hard-faced band was found to be only 0.08-inch, and the greatest wear over the entire sub only 0.20-inch, this occurring at the point of calipering nearest the upstream end of the sub. This increase of wear progressively along the sub, as was expected, showed the diminishing protective effect of the hard-faced band as being closely proportional to relative wear readings.

The string is still in the hole, and although the upper ends of the wear subs are now close to the minimum diameters required for tool joints under operating conditions under which the subs are being run, it is expected that the subs will give another 50,000 feet of effective protection before they must be replaced or built up.

Flame Hardening

Mixed with the string of hard-faced wear subs were a lot of 50 which had been flame hardened by a patented process and which, apart from this treatment, corresponded with the remainder in the string.

These flame-hardened subs, distributed at random throughout the string, were of the same S.A.E. 3140 metal as the other subs, without change other than the 1/16-inch case or hardened shell created by the special heat treatment accorded them in the flame-hardening process. They were readily recognized in the string, being smooth all over, while the hard-faced band was plainly visible in all the subs carrying it. After a short time in the hole, the flame-hardened subs and the bands of hard-faced metal alike took on a high polish, enabling identification even under artificial light.

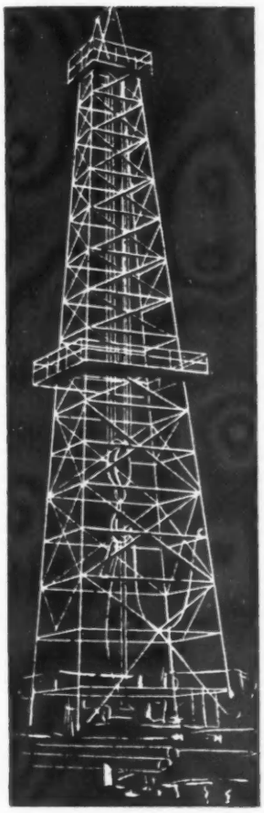
The flame hardened subs, checked at the 28,000-foot mark, were found to have sustained an average wear at point of maximum attrition of 0.049-inches and at 65,000 feet showed a reduction in diameter at the upper end checking point of only 0.08-inch. Over the entire run up to the time of the second check, it was determined that the feet of hole drilled for each 0.01-inch of maximum wear was, for the old joints (untreated) 2400, for the hard-faced, 3600, and for the flame-hardened, 6100 feet. These figures, of course, are not over the hard-faced band, which after all this running, still showed within 0.08 of its initial diameter. Wear of the land below the hard-faced band indicates that the protection is most effective at the shoulder and the band at that point is in position to give maximum shielding effect.

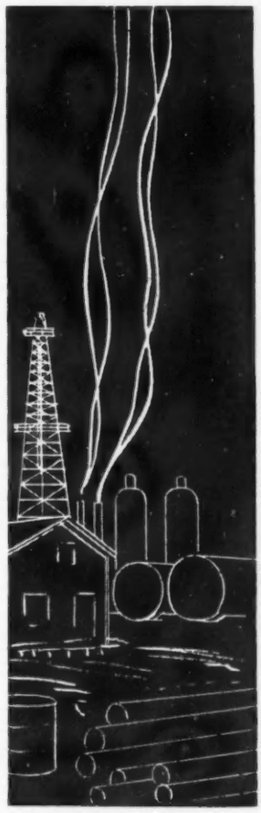
A drilling string is now in operation on a deep test on the Gulf Coast which cannot yet be detailed in terms of comparative wear. The string using tool joints throughout is made from S.A.E. 4140 steel, with the elevator shoulder built up of hard-facing material to withstand elevator wear, erosion of the mud stream and initial contact with the formation under the reaming effect which each shoulder has on its way down the hole. The entire cylindrical surface of both box and pin is flame hardened, being given a depth of case of ⅛-inch, instead of half that thickness, as was the case with the flame-hardened subs cited. It is anticipated that by this combination of hard-facing metal and flame hardening the maximum life may be attained with the wear subs, with a minimum of hard-facing metal, itself difficult to obtain due to war demands for it — and without demanding special analysis steel or, so long as the supply of discarded drill collars holds out, even any new raw material from which to turn the wear subs.

[1] Progress in Drill Pipe Assembly Equipment, THE OIL WEEKLY, Nov. 4, 1940.

[2] Cause and Prevention of Drill-Pipe and Tool-Joint Troubles, Part III, THE OIL WEEKLY, Nov. 24, 1941.

Season's Greetings





To THE MEN WHO GET THE JOB DONE

IN THE OIL INDUSTRY

FROM The **OIL WEEKLY** **STAFF**

HOME OF THE GULF PUBLISHING COMPANY, 3301 BUFFALO DRIVE, HOUSTON, TEXAS

Discovery Trends Indicate New Prospecting Methods Needed

By ESME EUGENE ROSAIRE, Subterrex*

WITHIN the past few months real concern has been expressed as to the ability of the petroleum industry to maintain its position with respect to established reserves, in view of the recent declining discovery rate being in contrast with the sharply increasing rate of consumption. Without exception, the only remedy proposed so far has been that of an advance in the price of crude oil, which would be expected to result in an increase in prospecting effort.

However, statistics at hand are susceptible to another and quite different interpretation from what has been proposed to date. There is reason for predicting that an increased prospecting effort of the type now current would produce only diminishing returns as compared with the industry's immediately past performance, thus increasing still more the already high costs of discovery. On the other hand, these same statistics indicate that, under past conditions similar to those which exist today, a major increase in prospecting effectiveness has been achieved only by the introduction and general use of new prospecting technique. That is, the desired increase in prospecting effectiveness is less likely to follow from a simple increase in the quantity of the present prospecting methods now showing diminishing returns than from a major increase in the quality of prospecting through retooling by the use of new exploration techniques.

Wallace E. Pratt[1] recently published an article[2] entitled "Oil Discovery Rate Three Years Hence Depends on Price of Oil Now," which does not seem to have attracted the attention which it merits. The accompanying charts on experience in oil exploration have been prepared from statistical data that appeared in the article by Pratt. Since Pratt used a running three-year total, the statistics may appear unfamiliar to those who are accustomed to annual totals. However, the three-year total has merit not only in smoothing out yearly variations, but also in approximating the time which usually intervenes between the start of a prospecting campaign and the completion of the test well.

Pratt points out that the number of dry holes is a good index for the effort expended in prospecting, for, though a few test wells result in discovery, these are compensated to some degree by the dry holes drilled as outpost wells to established production. The first graph shows the running three-year totals of dry holes.

The second graph shows the running three-year totals of major-field discoveries. These, as defined by Pratt, are those fields which will produce, ultimately, 20,000,000 barrels of oil or more. Pratt advises, in his article, that reestimates of reserves have been corrected back so as to credit the discovery year with the revised figures. This graph is the prospector's index, since he discovers fields one by one, and may expend as much effort in the discovery of a small field as he does in the discovery of a large field.

The third or bottom graph shows the running three-year totals for discovery reserves, obviously an industry rather than a prospector's index. Note how the discovery of the giant East Texas oil field resulted in an outstanding peak of discovered reserves for the year 1930.

The fourth chart shows the ratio of dry holes per major discovery for the three-year periods. This, again, is a prospector's index, showing the overall odds against his wildcat resulting in a major discovery. Also, this index is the reciprocal of what might be termed "prospecting effectiveness," for the minimum reached in 1934-1936 represents the peak prospecting effectiveness achieved in this 20-year period.

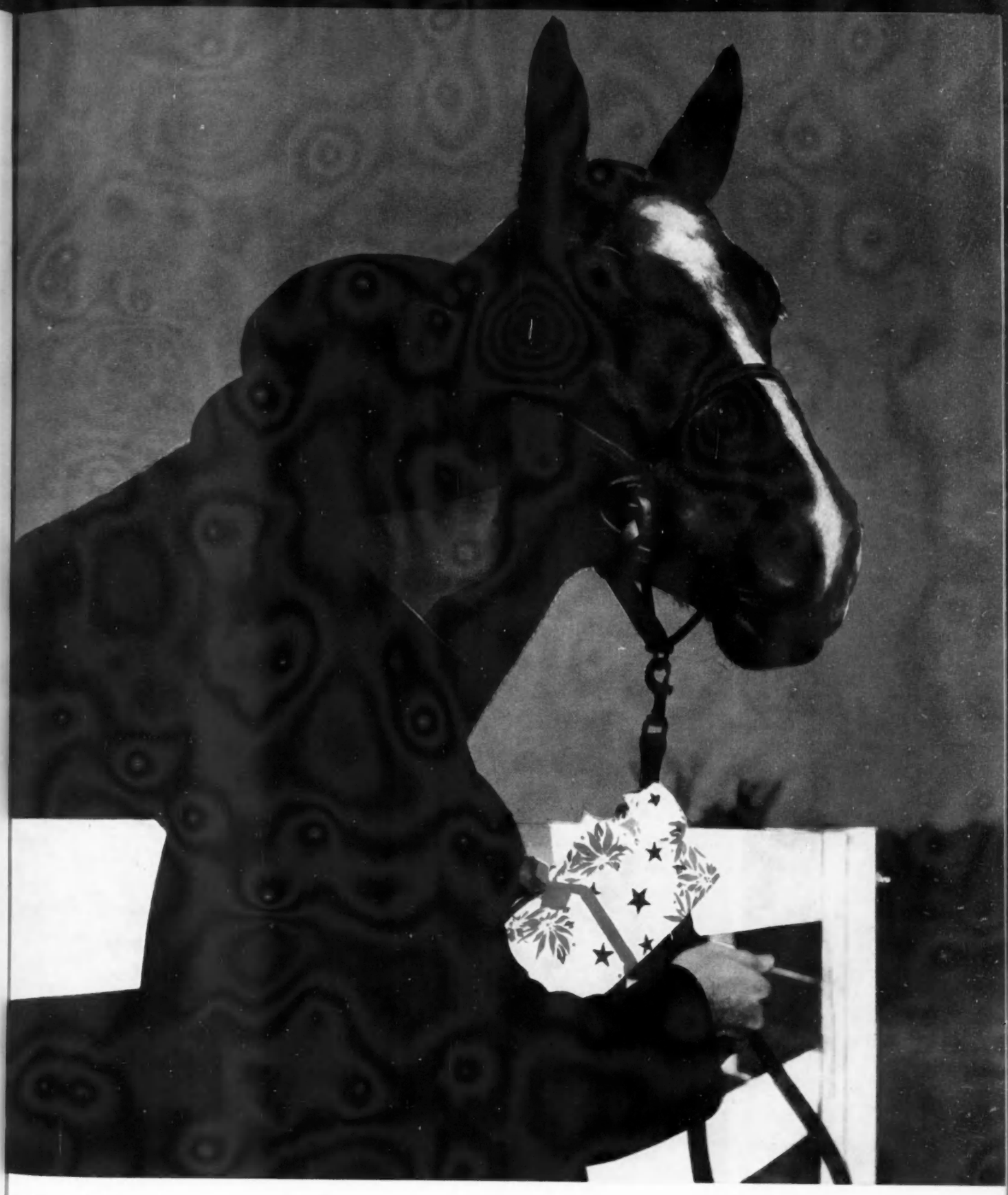
It is also of more than passing interest to note how, since that time, our prospecting effectiveness has decreased at an ever-increasing rate, establishing a trend of diminishing returns which shows no sign of reversal to date.

The fifth chart shows the ratio of thousands of barrels discovered per dry hole, of interest primarly to the industry in that it shows the extent to which the prospecting program is carried on at a profit. As yet, the dry-hole program can be said to have been carried on at a profit (insofar as the barrels carried to reserve are greater involved than the cost per dry hole), but at the present time this index is not only alarmingly low, but also displays a decreasing trend which shows no sign of reversal since 1934-1936.

The sixth chart shows the weighted price of crude oil for running three-year periods from 1920 to 1940, and suggests, particularly in view of the other charts, that an increase in the price of crude oil is imminent, if not past due.

Those who are interested primarily in prospecting will find the most pertinent information in the fourth chart, the dry holes per major discovery ratio, particularly when one recalls that a two- to three-year period intervenes between the initiation of a prospecting campaign and completion of the test well. In other words, this index for 1940 evaluates the prospecting effectiveness of our exploration campaigns initiated in 1937. In view of the well-established trend of this index for the past few years, it is a matter of grave concern to visualize how the results of our 1941 prospecting will show up in this index for 1943. Will any reasonable increase in the price of crude oil be enough to convert the 1943 index in Chart 5 (thousands of barrels discovered

* Presented before Houston Geological Society, October 23, 1941.



Merry Christmas... and... may all your bets be on the right horse in 1942

FRICK-REID

per dry hole) to enough to show a profit for the industry's dry-hole program for that year?

There is another point of interest in Chart 5 (dry holes per major discovery ratio). From 1920 to 1925, that index dropped, indicating increasing prospecting effectiveness. That was the period following the introduction and widespread application of surface geological methods throughout the United States. In 1925, that index started up, representing the diminishing returns which inevitably follows the widespread application of any successful prospecting method. By 1925, there were few remaining undiscovered surface structures. No matter what improvement took place in surface geological methods thereafter, diminishing and then vanishing returns were sure to follow, for surface structures had been discovered at a rate much faster than that at which they were formed in nature. It was inevitable that the dry holes per discovery index should rise after 1925.

However, that same index dropped following 1930, a drop which, however, did not result from the continued application of improved surface geological methods. Rather, the increased prospecting effectiveness followed from the introduction of a new prospecting technique, the reflection seismograph.

Increased and then widespread application of the reflection seismograph materially increased prospecting effectiveness, until about 1933-1935, a peak (i.e., a low in dry hole per major discovery ratio) was achieved, the peak prospecting effectiveness for this 20-year period. Since that time, the dry hole per major discovery ratio has increased, so that the reflection seismograph cycle is quite similar to that for the surface geological methods. Once again, though the technique improves from year to year, diminishing and then vanishing returns appear. Once again the industry is reaping the harvest of discovering structures at a rate much faster than that at which they are formed in nature.

These statistics indicate that the industry now is confronted by a situation which was predicted as far back as 1936 by a few members of the prospecting profession. Among those prophets of impending lower discovery ratios were A. I. Levorsen, then president of the American Association of Petroleum Geologists, Dr. L. W. Blau of Humble Oil & Refining Company, the writer of this article, and others.

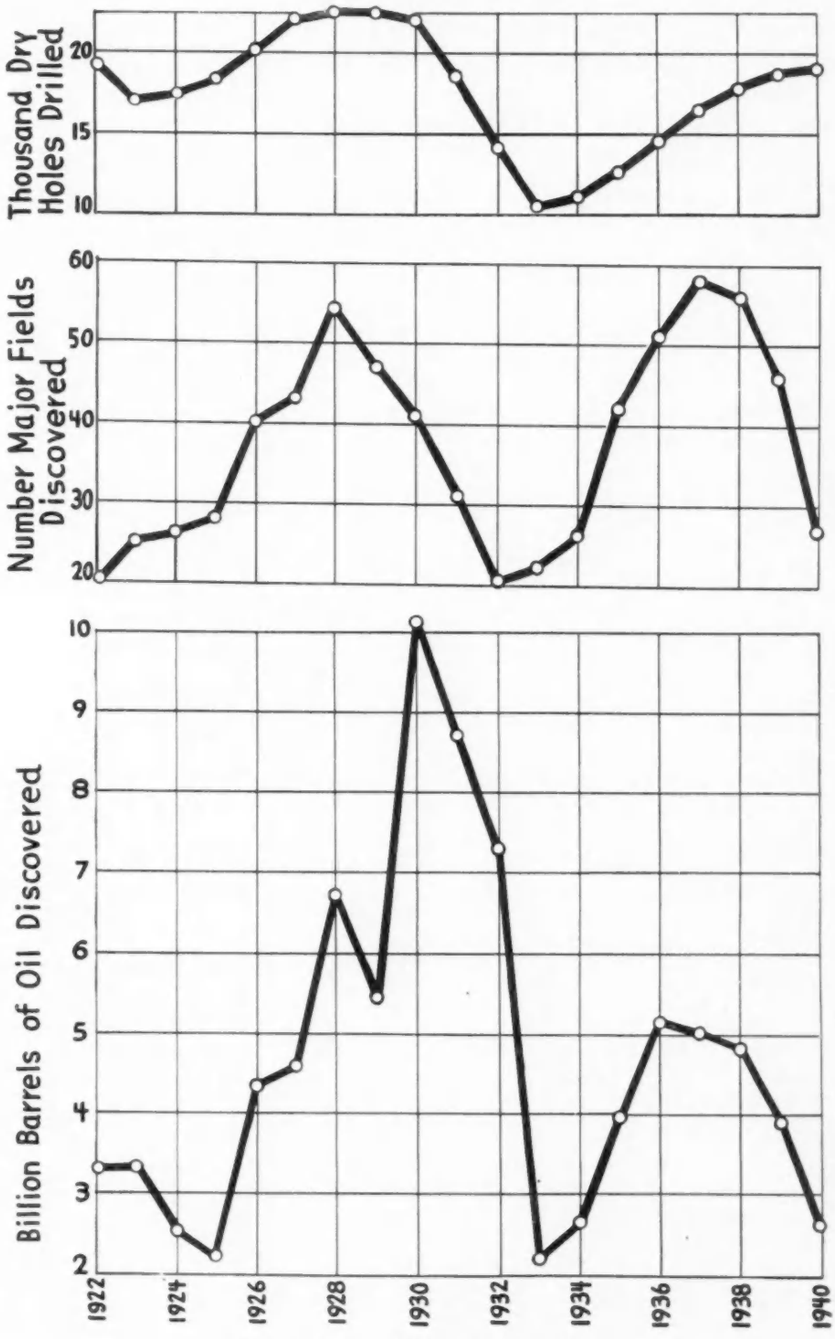
Some of Levorsen's comments of that time are of particular interest. The following quotations are from his presidential address before the A.A.P.G. in March, 1936, as follows:

"However, by whatever method used, the search has been always for local deformation such as anticlines, domes, faults, and similar

Experience in Exploration for Oil in United States

To smooth out erratic, short-term inequalities, data are arranged in successive three year totals, each including the last two years of the preceding period. All curves based on statistical data presented in article "Oil Discovery Rate Three Years Hence Depends on Price of Crude Now," by Wallace E. Pratt in July, 1941, issue of **Mining and Metallurgy** magazine.

Charts 1, 2 and 3

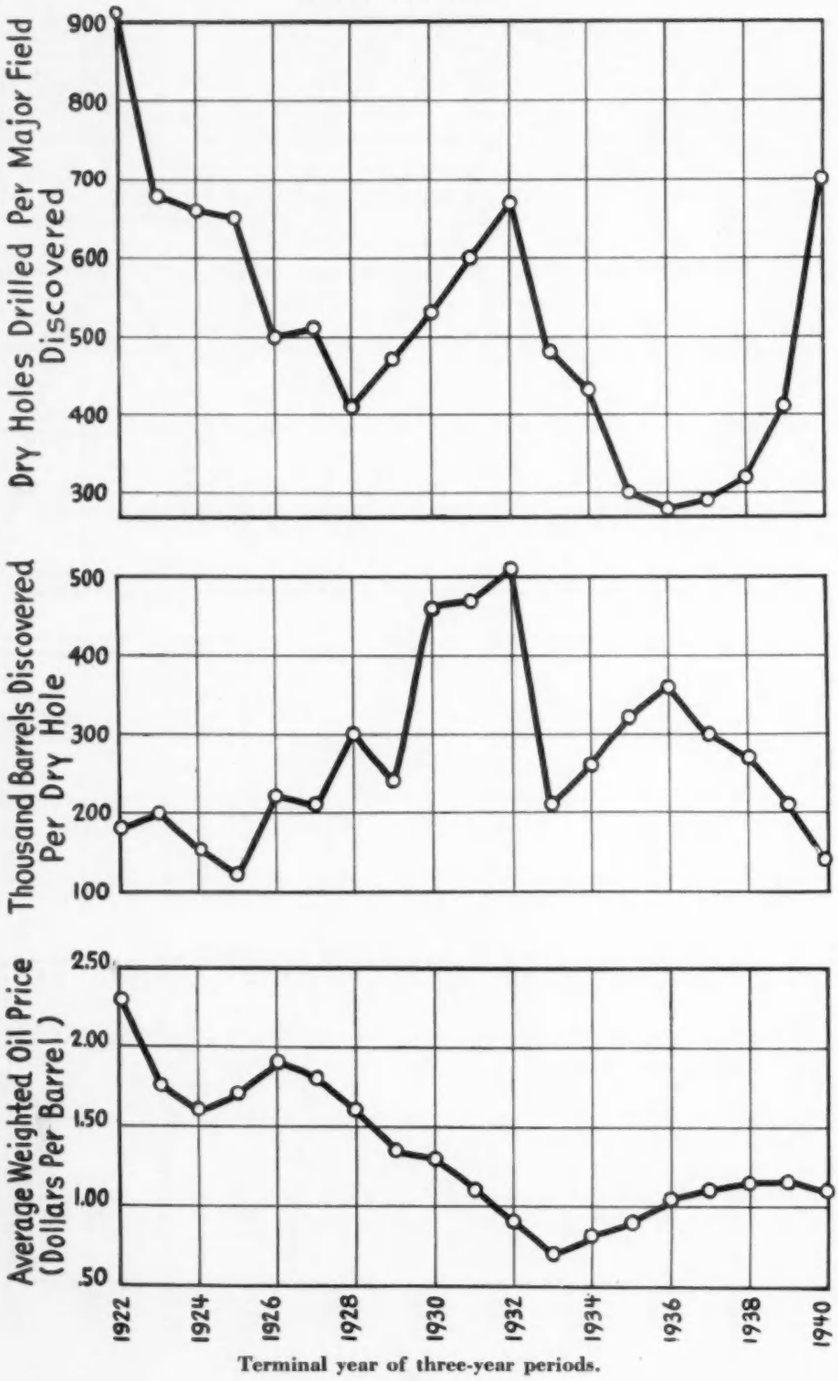


Terminal year of three-year periods.

Experience in Exploration for Oil in United States

To smooth out erratic, short-term inequalities, data are arranged in successive three year totals, each including the last two years of the preceding period. All curves based on statistical data presented in article "Oil Discovery Rate Three Years Hence Depends on Price of Crude Now," by Wallace E. Pratt in July, 1941, issue of **Mining and Metallurgy** magazine.

Charts 4, 5 and 6



Terminal year of three-year periods.

features. We began looking for such structure at the surface by surface methods and we have progressively deepened the plane of our search until we are now actively searching for domes which occur at depths of 5000 to 10,000 feet and in some areas even deeper. The present wave of seismic exploration at these great depths might be said to be the last stand of local structure to escape detection and these geophysical methods are rapidly finding all the folds and local deformation which were missed by previous methods. As each method of structure hunting was developed, it provided a sufficient number of new folds for exploitation so that the current petroleum needs were met. We have all, therefore, drifted along from one structure-finding method to another until now we are apparently approaching the real danger of an oversupply of methods and an undersupply of anticlines."

Further on, in the same article, Levorsen said:

"Since the search for domes, anticlines, and similar types of local deformation has been our chief method of attacking the problem of oil discovery, and if we are approaching the end of our supply of such structures for the very reason that we are rapidly exhausting our finding methods down to the lowest depths at which we can drill for oil, then what of the future? Where are we to find this billion barrels of new oil per year which all observers seem to think the nation will require for many years to come? The oil industry is not interested in our contours, in our gravity maxima and minima, in our rock velocities, our theories; it is interested in us only in so far as we can tell where to drill to find barrels of oil. It is our job to find this oil and if we fail, the industry will find someone else to do it."

Viewed in perspective, our present prospecting situation represents a reappearance of that diet deficiency disease which follows from over-indulgence in a too monotonous prospecting fare. Our experience with the last previous appearance (1925-1930) of the prospecting equivalent of pellagra shows that the cure resulted not from increasd doses of the then current if better prepared prospecting diet, but rather from a complete change in the menu. As in 1930, the present trend toward vanishing returns in prospecting can be reversed only by the utilization of new prospecting methods. In the writer's opinion, the most promising are those which are directed at the recognition and measurement of the geochemical manifestation of the petroleum accumulation itself, a direct prospecting approach as contrasted with the present general reliance upon the indirect approach of structural prospecting.

[1] Vice president and director, Standard Oil Company of New Jersey.
[2] Published in "Mining and Metallurgy" magazine, July, 1941, issue.

ONE great name
for THREE great products . . .
Pittsburgh Special
CASING
DRILL PIPE
TUBING
Pittsburgh Seamless Tubular Goods have been so favorably known and widely used in the oil country, that the trade-name Pittsburgh has become a symbol for dependability. Likewise, Pittsburgh Special instantly conveys to dollar-wise operators the idea of premium values that far exceed the relatively small additional cost.
Pittsburgh Special Casing, Drill Pipe and Oil Well Tubing include every desirable feature, many of them exclusive, that advanced engineering design can give them. All are factors that make producing operations safer, faster and cheaper.
If you are not familiar with the advantages of Pittsburgh Special, full technical data is available upon request. Additionally, complete information is filed in Pittsburgh's 20-page catalog in the present as well as forthcoming edition of the Composite Catalog.
PITTSBURGH STEEL COMPANY
PITTSBURGH, PA.
NEW YORK CLEVELAND DETROIT CHICAGO
TULSA HOUSTON LOS ANGELES
Pipe Storage Yards: Memphis, Tenn. . . . Houston, Texas . . . E. San Pedro, Calif.
Export Distributors: Lucey Export Corporation . . . New York, N. Y., U.S.A.
Pittsburgh Special
CASING • DRILL PIPE • TUBING
PATENT NO. 1,942,518

Design of Casing Strings

By EMORY N. KEMLER
Associate Professor of Mechanical Engineering, Purdue University

Theory of Casing Collapse

PART 4

FACTOR of safety is that term used to cover the discrepancy between actual practice and theory. The size of the factor of safety to be used will be determined by what it must cover. Some of the things which it must take into account are discrepancies between test data and actual performance, inability to determine actual loads to which casing is subjected and ignorance of designer as to properties of product, application conditions, or theory.

The development of any theory, no matter how good or how poor, must be made on the basis of certain assumption. In some cases the basis of the theory may be so well founded as to make the theory in accordance with actual operating conditions, if the designer is able to evaluate these conditions. In other cases, the theory may at best be only a rough approximation and cannot be expected to fit operating conditions with any reasonable accuracy. In such cases, the designer must resort to empiricism. The ability of the designer and his familiarity with the problem will largely determine this personal factor.

The ability to predict loads is obviously important. As far as collapse is concerned, the prediction of loads can be made with very good accuracy. The pressure which normally causes failure is the result of a hydrostatic pressure of a column of mud, and is not normally subjected to any dynamic loading. Under normal conditions the collapsing pressure can be very closely predicted. For normal con-

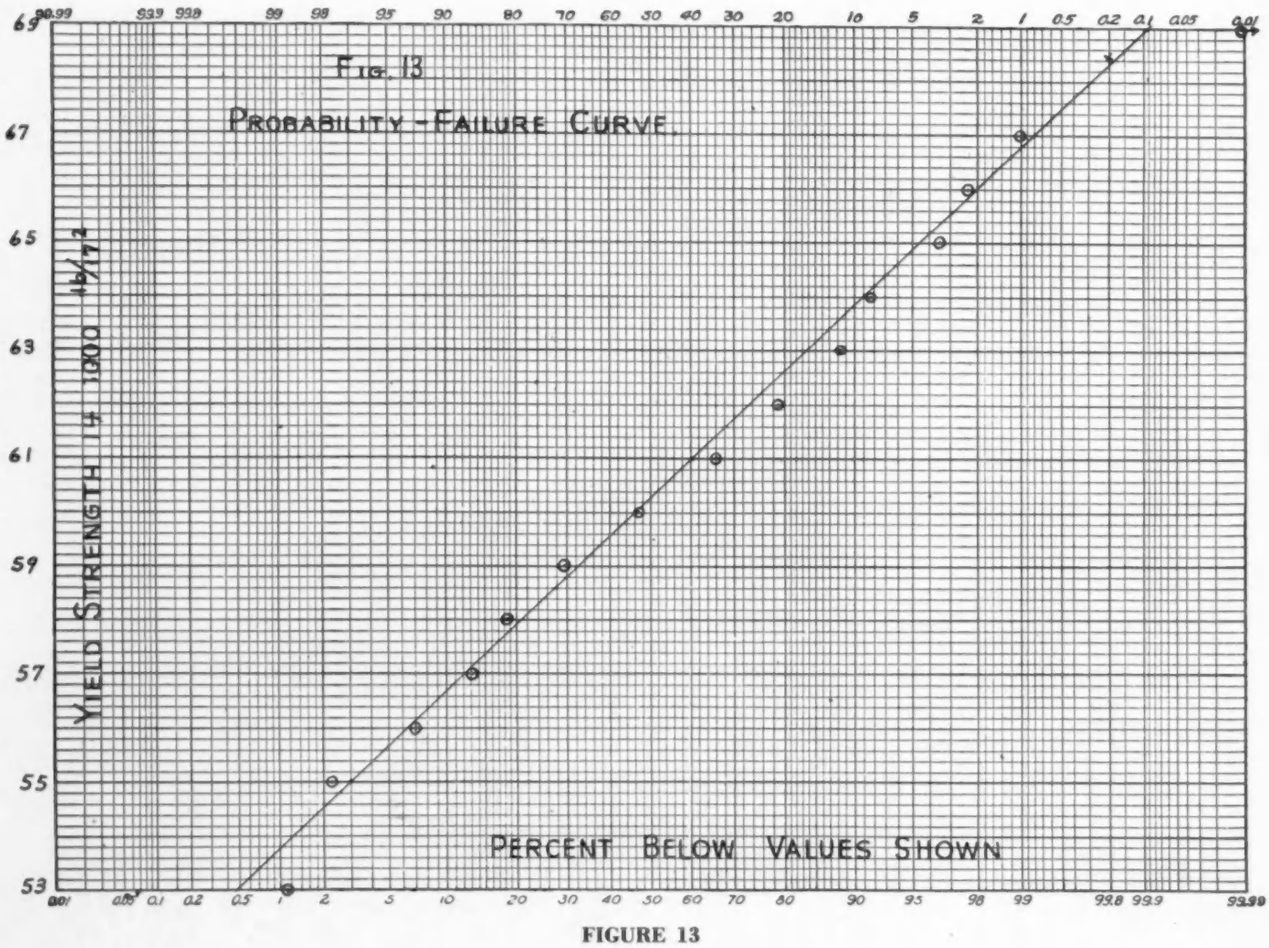
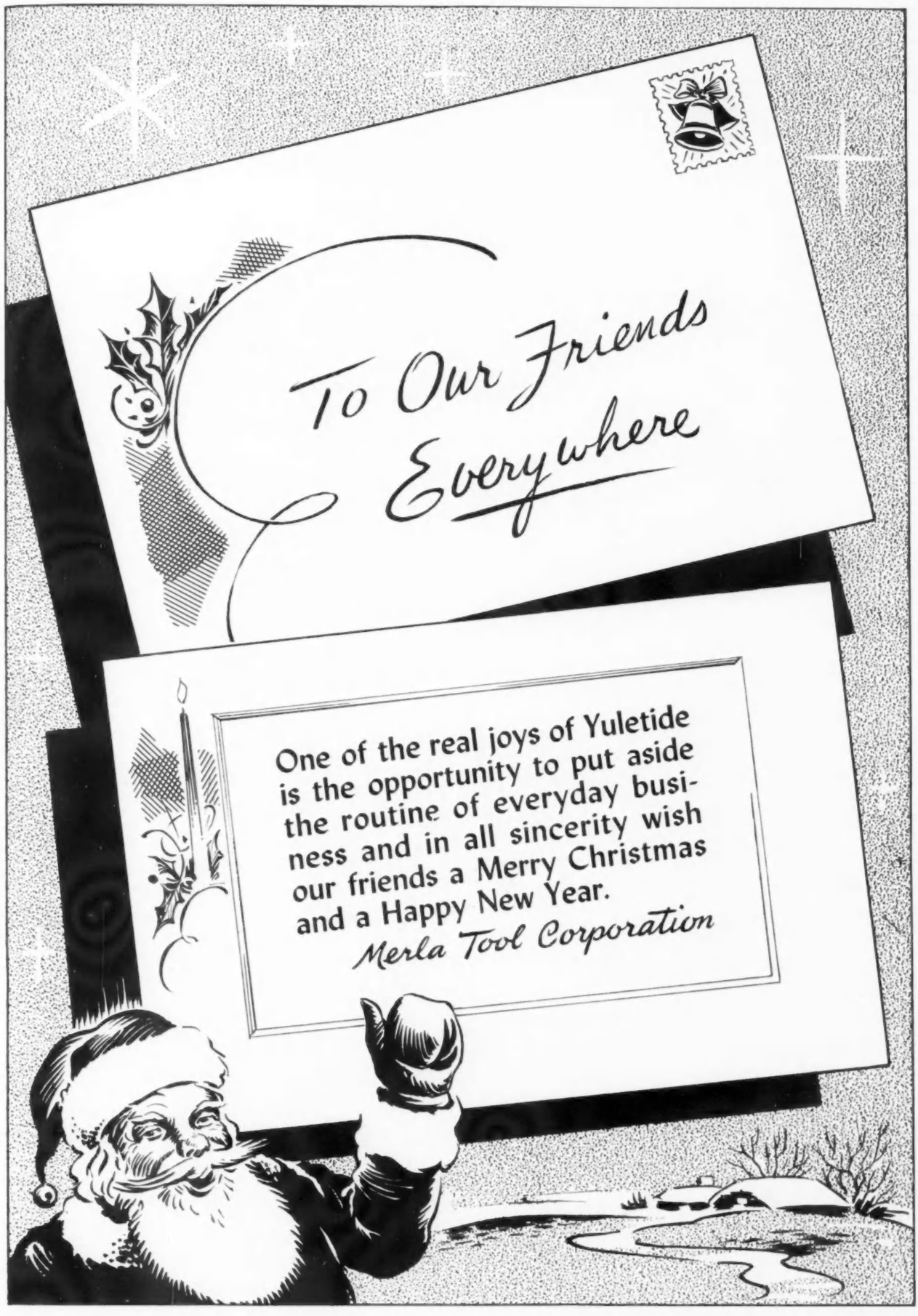


FIGURE 13


To Our Friends Everywhere
One of the real joys of Yuletide is the opportunity to put aside the routine of everyday business and in all sincerity wish our friends a Merry Christmas and a Happy New Year.
Merla Tool Corporation

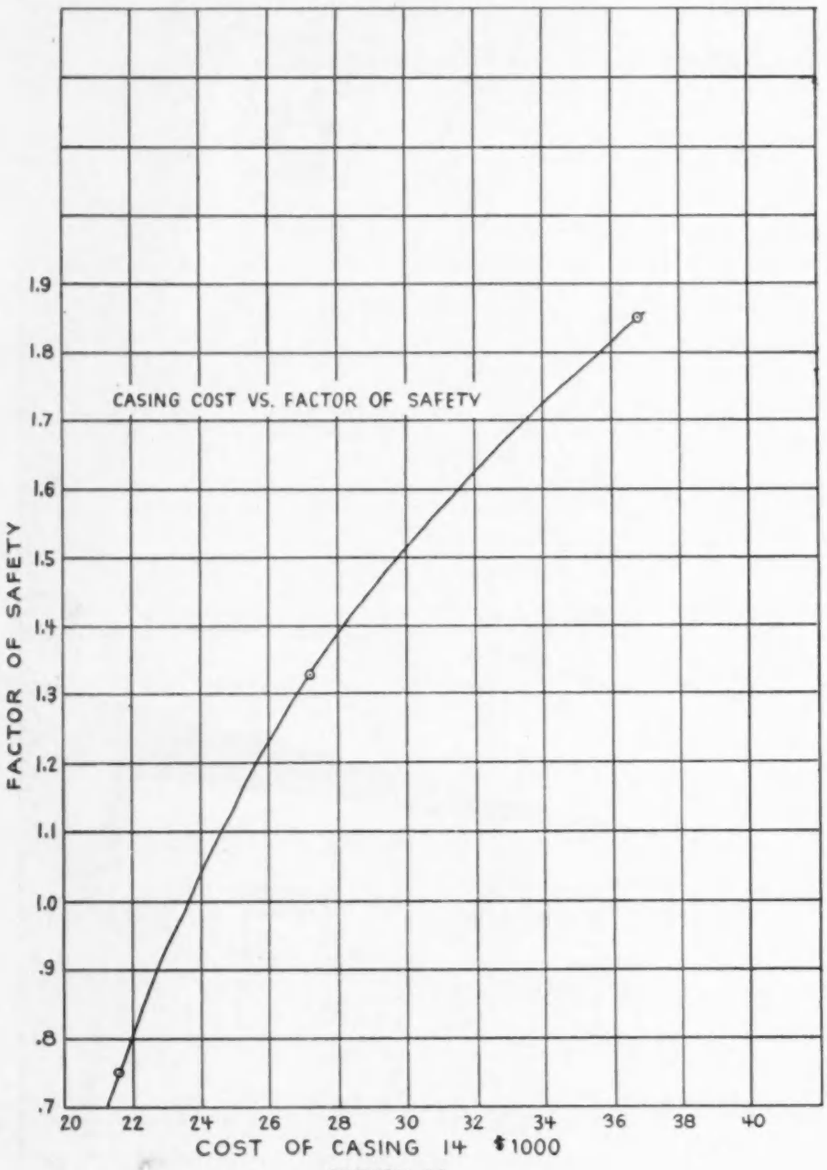


FIGURE 14

ditions, no additional allowance need be made for calculated loadings if all factors are known.

The evaluation of the strength of the product is unfortunately not so easily determined. Two methods of approach are possible in this connection. One which has been widely used in the past has been to base the strength on average properties or strength values. The other which has been recently introduced is to base all values on minimum values. The use of 75 percent of the average value as the minimum value for casing collapsing pressures shows why relatively high factors of safety have been necessary in the past. For example, a factor of safety of 2 based on average values would be equivalent to a factor of safety of 1.5 based on the minimum values. The designer has had to introduce a factor of 1.33 in order to reduce average values to minimum values.

The arbitrary setting of a minimum value does not, unfortunately, carry with it any insurance that it will be met. In order to be able to evaluate the meaning of the minimum value, the designer must know something about the control exercised by the manufacturer. The theory of statistics forms one method of evaluating the strength of commercial casing.

To illustrate how this method can apply, an example will be given. While this example is based on very much simplified assumptions, it shows the principal factors involved. The basis for the statistical method required that actual or representative test data be used. Table 5 shows data from 86 tensile tests on a 55,000 minimum yield strength steel. These data have been plotted on probability paper as shown in Figure 13. This plot shows that 50 percent of the values occur at a yield strength of 60,300 pounds per square inch, which is the average. This curve shows for example that at a yield strength of 55,000 pounds per square inch that 3 percent of the casing will fail. This average curve will be considered as representing the product made by the mill. It is assumed that the percentage of collapse values will also follow this curve.

TABLE 5

No. of Tests	Yield Strength	Percent Failures Below Value
1	53,000	1.17
0	54,000	1.17
1	55,000	2.35
4	56,000	7.07
5	57,000	13.0
5	58,000	18.8
9	59,000	29.4
15	60,000	47.0
16	61,000	66.0
11	62,000	79.0
8	63,000	88.3
3	64,000	91.8
4	65,000	96.5
1	66,000	97.7
1	67,000	99.0
0	68,000	99.0
1	69,000	100.0

Using this curve as a basis, it is then possible to calculate for a given factor of safety based on minimum values, the number of failures which will occur. In the example which will be worked out, the cost of casing will be considered as that given in Figure 14. It has further been assumed that the drilling costs will be $60,000. (This does not include casing cost.) On the assumption that the total cost will be lost in the event of a casing failure, it is possible to figure out the total cost for a well. While the total cost normally may not be lost, the fishing, side-tracking or other expense is normally sufficiently high that the conclusions based on the above assumptions are not greatly altered.

Table 6 shows a summary of the calculations made for various factors of safety. The factor of safety of 1 has been set up for a minimum yield strength of 55,000 pounds per square inch. The working stress for any other factor of safety can be calculated from this by dividing this stress by the factor of safety. These values are given in the column marked *working stress*. From Figure 13, the percentage of failures (i.e. the percent-

Photo by W. A. Oberlin

Wherever Oil Is Produced...

. . . the recognized answer to emulsion problems is Tret-O-lite. Its general oil field use for many years has led to the development of varied compounds suitable for treating the different types of crude oil emulsions encountered.

If you have an emulsion problem, it's a job for the Tret-O-lite organization . . . phone or write for your nearest representative or Tret-O-lite office.

Practical Experience

Scientific Research

Aggressive Development

Free Advisory Service

Trained Representatives

TRETOLITE COMPANY

Manufacturing Chemists

Webster Groves, St. Louis County, Missouri
Los Angeles, California

Representatives in All Principal Fields

Tret-O-lite

Reg. U.S. Pat. Off.

DEHYDRATING **DESALTING**

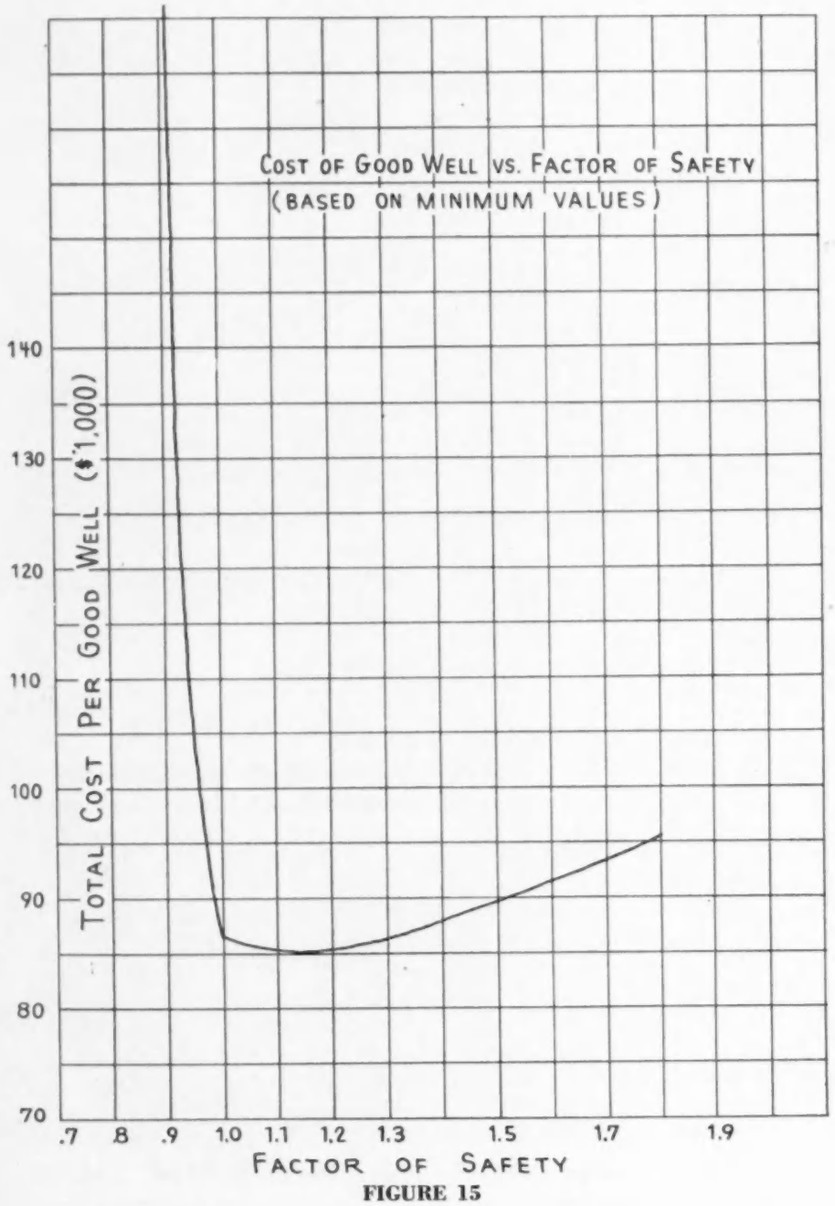


FIGURE 15

age of values at which failure occurred below this value) can be found. For 55,000 pounds per square inch, there was 3 percent of the tests which came below this value. For a stress of 46,000 pounds per square inch there would be only a very small fraction of 1 percent so that for stress values below this no failures are shown. For a stress of 73,000 pounds per square inch, over 99.99 percent of the members would show failure. Below the minimum value, there are very few failures. These failures increase very rapidly as the stress value increases.

The cost of casing as determined for Figure 14 is shown in the next column. The cost of well and casing is taken as $60,000 plus casing cost. The cost of a good well will be the cost of a well for the conditions shown divided by the percentage of good wells. For example, for a factor of safety of 1, 97 percent of the wells will be satisfactorily completed. The cost of a well will be $83,600 and of a good well will be $\frac{83,600}{97} = \$86,400$. For the lower working stresses, the percentage of good wells is so near 100 that the total cost of a good well is, on the average, the cost of casing plus the cost of drilling. For higher values of working stress, the number of failures increases so rapidly that the cost of a good well goes up very rapidly.

Figure 15 shows a plot of cost per good well against factor of safety. This cost increases so rapidly for factors of safety below 1 that they can never be considered. The cost increase above 1 is rather slow. For a factor of safety of 1.2, the cost is a minimum. On the basis of the above assumptions, it can be seen that factors of safety below 1.2 based on average are not worth considering. If there is any question as to operating conditions the factor of safety should be increased considerably above this. A factor of safety of 1.2 based on minimum values is equivalent to 1.6 based on average values.

There are many cases where factors of safety less than the 1.2 or even 1, based on minimum values, have been used. This does not in any way imply that such factors of safety are sound practice or even remotely economically feasible. If a well is completed normally and the inside of the casing is kept under pressure at all times, failure would not occur until the bottom-hole producing pressure had become nearly depleted. The approximate method given in this article serves as a general basis for getting some idea as to the probability of having a failure with any factor of safety.

TABLE 6

Factor of Safety	Working Stress	Percent of Failures	COST		
			Casing	Well and Casing	Good Well
.75	73,000	99.99	21,600	81,600	817,000,000
.80	68,500	99.8	22,000	82,000	41,000,000
.90	61,000	60	22,800	82,800	207,000
1.0	55,000	3	23,600	83,600	86,400
1.2	46,000	....	25,600	85,600	85,800
1.4	40,000	....	28,200	88,200	88,100
1.8	20,000	....	35,600	95,600	95,700

OIL MEN WILL UNDERSTAND

Why MORSE ROLLER CHAINS LAST LONGER

Oil men searching for sturdy, long-lived roller chain realize the importance of the exclusive Morse design which puts a "force feed" lubrication system in every link, feeding oil to the heart of the chain, the pin and bushing areas.

In a Morse roller chain, oil gets in, wear stays out. Life-preserving lubrication makes Morse roller chain last longer, perform smoothly through the most exacting service.

Get Morse interchangeable, channel lubricated roller chain. All sizes and capacities, single and multiple widths.

Houston Office—1418 Polk Ave., Houston, Texas

MORSE ALSO MAKES

Silent Chain Drives
Silent Chain Couplings
Roller Chain Couplings
Morflex Couplings
Morflex Radial Couplings
High Torque Indexing Clutches
Indexing and Free Wheeling Clutches
Free Wheeling Clutch Couplings
Pullmore Clutches

SILENT CHAINS ROLLER CHAINS FLEXIBLE COUPLINGS

MORSE *positive* DRIVES

MORSE CHAIN COMPANY ITHACA N. Y., DIVISION BORG-WARNER CORP.

Practical Operating Hints for

1. DERRICK FLOOR ENCLOSURES

Removable Posts and Rails Permit Speedy Assembly of Important Working Safeguard

Sockets in floor timbers and retaining washers around posts support railing and still permit escape if emergency demands hasty quitting of rig working space.

GUARD rails around the edges of the derrick floor behind the drawworks and on the unprotected sides safeguard the crew, but often necessitate consumption of considerable time in erecting or dismantling rig. Removable rails may be made which supply ample protection, but which are easily lifted from their positions when moving.

Supporting posts are made of 4-foot pieces of 1½-inch pipe welded to set in the center of a small circular plate, with holes drilled through the plate for bolting or nailing to the floor. Tops of the posts are rounded for safety by placing in the socket on the open ends steel balls about two inches in diameter, and welding the oversize balls in this position. Sockets are attached to the posts at proper places for connecting two parallel rails, and made of 3-inch sections of 1½-inch pipe, welded parallel to the sides of the posts.

Each guard rail is approximately 10 feet long, constructed of 1-inch pipe, and with the extreme two inches of the ends turned down at a 90° angle. These provide arms which are entered in the proper sockets at both ends, and the rails are thus held firmly in position. The corner posts at stairway connections are also equipped with sockets for joining stairway guard.

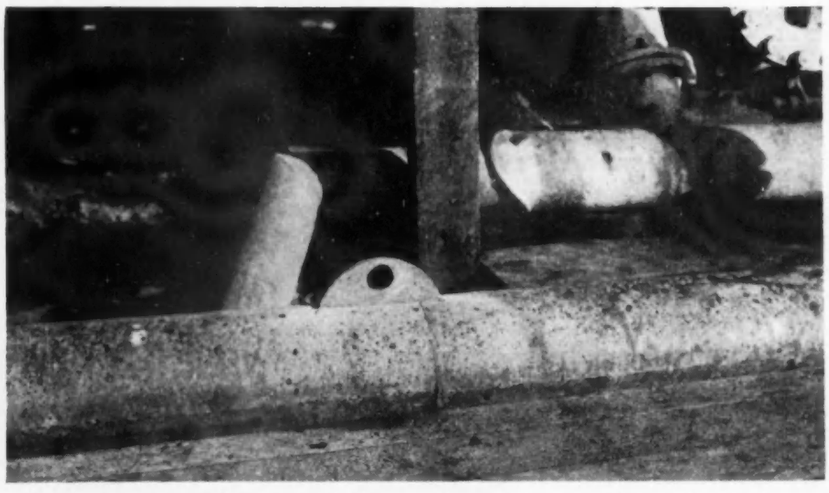
2. STEAM LINES

Prefabricated Eyes Assist Line Transfer

THE recent trend toward obtaining better steam efficiency in steam-operated drilling equipment is responsible for the attention that one company is directing toward the proper care and handling of insulated and metal-sheathed steam lines.

Before the steam line was covered, steel plates ½-inch thick and cut in half-circle form, with a 1½-inch hole cut through the upper part of each, were welded at intervals along the top side of the steam pipe. When the line was covered with a layer of insulating material and the outer, welded sheet-metal covering, the steel eye projected above it, providing a convenient hook for a light winch-equipped truck crane. Less damage or injury to the covering resulted, as compared to the old methods of moving the steam lines.

One steel eye welded in the center of each joint proved to be the most convenient interval for handling joints of pipe in this manner.



Semicircular plate with eye for lifting hook extends beyond pipe insulation and permits winch handling without hazard to covering or danger of accidental slip.

3. RATHOLES

Floor Suspension of Unit Speeds Rigging

ARMS welded to the rathole pipe at the proper distance from top will bear weight of the pipe and throw the entire support on the derrick floor. This simplifies digging the rathole, as it may very in depth provided it is sufficiently deep for the pipe, and it also maintains top of the pipe at a constant height. Some operators prefer to have top of the pipe at an unusually great height above the floor to keep swivel and bails out of the way of the men and equipment when making trips out of or into the hole.

Arms may be made of four

THE DRILLING RIG . . .

Horizontal brackets and angle braces distribute pipe weight across derrick floor and prevent shift.

pieces of ½-inch steel plate, cut to dimensions one foot long and two or three inches wide, welded perpendicularly to the rathole pipe at the desired level, spaced at 90° intervals around its circumference. Bracing made of similar stock about 8 inches long is welded to the pipe and to the bottom arms, at a 45° angle.

The pipe is lowered through the floor, after the rathole is dug, and the arms, extending at right angles from the pipe, engage the edges of the hole in the floor due to their greater diameter, supporting weight of the pipe at that point regardless of depth of the hole. The floor is usually reinforced in the area where the arms are in contact with it, to remove possibility of placing undue stress on the flooring.

4. CLEANING

Gas-Powered Spray Gun Clears Grease

ONE pot fireman, with a desire to keep his equipment clean and neat without spending considerable time in so doing, made a spray gun for handling cleaning fluids and applying them on objects to be cleaned. His principal equipment consists of an old oil burner, with a can on top holding one quart of his cleaning mixture. At the bottom, a connection is placed for joining to gas line to atomize the mixture.

In the quart can, the cleaning mixture, consisting of motor and kerosene is placed, and the top of the can screwed on. The tin top is provided with a small hole in its center for vent. To facilitate proper feeding of fluids into the gun. When gas is applied by means of a valve provided for the purpose, action of the fluid and the gas pressure forces the fluid in a fine spray from the nozzle of the gun and on equipment being cleaned. Force of the blow drives the fluid into crevices and into corners, cleaning these portions where otherwise considerable time and effort would be required. The gun offers an incentive to keep equipment clean and sightly, and provides a simple way of its achievement.

Container mounted above ejector jet carries solution for dissolving and washing away dirt masses.

THE practical operating hints for the drilling rig and production man, appearing in these features each week, are secured from oil fields everywhere and offer suggestions that will help to improve field efficiency and safety. The items give an excellent picture of the remarkable ingenuity being exercised by the operating divisions of the industry. Contributions to these features will be paid for at the rate of $5 for each illustrated item accepted. Address contributions to "The Editor, THE OIL WEEKLY, Houston."

5. SMALL PARTS

Buckets Prevent Loss And Assist Cleaning

MISCELLANEOUS small fittings, valves and tools are easily lost around the derrick floor while the well is being serviced. One company makes a practice of keeping several small open-ended drums or pails located handily near the corners of the derrick floor, into which such fittings may be thrown temporarily, instead of allowing them to be scattered about the floor and possibly becoming lost over the edge of the floor or in the cellar.

Comfortable hand grips for the bails of the containers are made up out of short lengths of ½-inch flexible metal conduit material. Cleaning solvent may be poured directly into those buckets which contain the oily or dirty fittings. In this way a minimum of time is consumed in handling them before they are again placed in the fittings bins ready for further use.

Provision of these containers permits collection of protectors and small parts during rig operations.

Here comes your P

CATERPILLAR

REG. U.S. PAT. OFF.

ENGINES AND ELECTRIC SETS • TRACK-TYPE TRACTORS • ROAD MACHINERY

Pipeline!

[From a "Caterpillar" advertisement to the general public in *The Saturday Evening Post* (October 11, 1941).]

ARTERIES OF OIL! Safely buried in cornfields — threading through thickets — anchored to river beds — winding along ravines and over hills — lies a vast network of steel and iron pipe. Through this system pour millions of barrels of oil and tremendous volumes of natural gas . . . life-blood of American industry, transportation, national defense! And with the nation's growing demands, still more lines will be required.

With modern "Caterpillar" Diesel equipment, building a cross-country pipeline — once the work of years — is now possible in *months*.

Wielding big, brutish bulldozers, "Caterpillar" Diesel Tractors clear away brush, trees, stumps and rocks along the right of way. Multi-scooped ditchers, powered by "Caterpillar" Diesel Engines, cut the trench at the head of the line. Then the tractors, with winches and sidebooms, swing and stab the pipe into position for welding. They bend it to fit slopes and curves; cradle it for doping and wrapping; lower it; cover it — backfill the trench.

Thus, through the power, versatility and stamina of "Caterpillar" Diesel equipment, pipeline laying really moves fast . . . quickly providing speedy and dependable oil transportation wherever it is needed.

On hundreds of other projects as well — whether defense, industrial development, or in behalf of the nation's economic advancement — "Caterpillar" Diesel Tractors and Engines are virtually indispensable for construction speed, efficiency and minimum cost.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

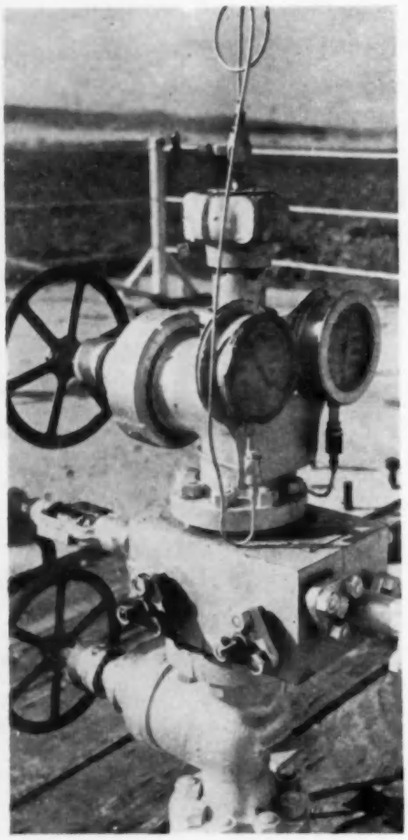
R DIESEL

RY

Practical Operating Hints for

1. GAUGES

Rigid Support Guards Against Damage



Formed plate mounted on valve body holds units securely and protects from injury.

PRESSURE gauges on the Christmas tree usually are first on the casualty list of lost or broken equipment. Unprotected gauges usually suffer broken glasses, stripped threads on the fitting end, or the case warped to such an extent the mechanism becomes useless.

One California company makes it a practice of mounting the principal gauges, those indicating the tubing and casing pressure, on flat 3/16-inch steel which is cut in the general shape of the pressure gauges mounted side by side. This steel plate is then clamped to the back side of one of the valves of the Christmas tree by means of U-bolts that encircle the body of the valve. Pressure reaches the gauges through copper tubing from well connections.

This permanent set-up of the gauges results in prolonging the normal expected life of the instruments, and their readings are much more reliable between regular periods of inspection. An added advantage is that of making it possible for the pumper to read the pressures on the well with a minimum of effort and time spent at each location.

When the well is to be pulled or worked on, it is necessary only to detach the copper tubing fittings, and remove the U-bolts holding the assembly to the gate. The entire unit may then be laid aside out of danger of breakage or other injury.

To protect the gauge stem threads, a collar is made up on the gauge, as it is easy to replace the collar when the threads become worn.

2. FIRE PROTECTION

Covered Hose Reel Aids Fire Fighting

TO provide adequate fire protection where it is needed most and yet protect the fire hose from the weather, has always been a problem for the oil field operator. One California operator solved this problem by combining an all metal waterproof fire hose container and free revolving hose reel into one unit.

This unit consists of a 3-foot diameter steel plate ¼-inch thick upon which the fire hose is coiled. Through the center of this sheet a six-inch length of 2½-inch pipe is securely welded. Driven securely into the ground another piece of 2½-inch pipe is set with about three feet of length standing upright. A short piece of 2-inch pipe is then welded into the top of the 2½-inch pipe leaving 6 inches protruding above the top of the 2½-inch pipe. The large steel disk is then slipped over this protruding 2-inch pipe, making a loose fitting bearing.

Over the entire disk a suitable light metal cover constructed from discarded tank sides, is placed. The top is made to fit loosely on this disk so that one man can easily lift the top aside. The conical top prevents rainwater from getting into the hose.

When it becomes necessary to use the hose, one end is taken hold of and pulled, causing the steel disk to revolve, thus unreeling the hose only as fast as it is pulled and preventing kinks. — *Ralph L. Fowler, Alhambra, California.*

Revolving disk mounted on pipe post carries storage plate for hose and with quick detachable cover facilitates getting hose to fire simply by pulling on hydrant connection end.

THE PRODUCTION MAN . . .

3. CONTROL

Knockout Installation Protects Regulator

Installation of moisture and condensate trap avoids danger from slugs in unit.

SUCCESSFUL operation of the pilot valve type of pressure regulator is dependent to a large degree upon the uninterrupted flow of high pressure gas from the upstream side of the regulator, through the small lines leading to the delicate mechanism which actuates the valves in the regulator. Keeping moisture and condensate out of this mechanism is an important problem in operating high-pressure gathering systems, since the presence of such fluids tends to encourage freezing of the fittings or valves, or possibly to interrupt the flow of gas to the regulator.

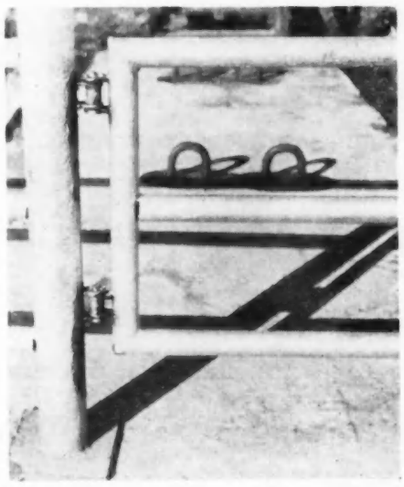
To eliminate as much as possible any moisture being carried over into the delicate mechanism, a California company uses a simple but effective system. Instead of leading the pilot gas line from the upstream side of the main line directly into the regulator, a small knock-out chamber is installed in the system, to which moisture and condensate may drop.

This chamber consists of an 8-inch length of 5-inch casing welded shut at both ends, with three ¼-inch collars welded into the top, and a single larger drain connection in the bottom. The wet high pressure gas enters through one of these fittings, the other two being for the dry gas lines to the regulator. For trouble-free performance, the small chamber is welded solid to one of the arms of the main gas line. At intervals, the chamber is drained by means of the valve at the bottom of the container.

4. ENCLOSURES

Drilling Chain Hinges Carry Enclosure Gate

CONSTRUCTION of the fence that surrounds the Christmas Tree and well location, for obvious reasons, must be done cheaply, yet must be strong enough to bar out range cattle. One company, fencing their flowing wells, makes the gate



Split on sidebar centers, a link of drilling chain makes effective hinge.

hinges from link sections of used rotary chain. The two end portions attached to each link pin are cut off and the respective halves welded to the fence end-post and the gate itself. These inexpensive, yet amply strong gate hinges will last as long as the fence itself, and need only a drop or two of oil occasionally to keep them in smooth working condition.

While the fence is built of salvaged tubing and line pipe, it nevertheless is constructed with an eye to the future when the same material may have to be used for other purposes. Horizontal members and cross-bracing sections are welded at each end with a comparatively short bead.

5. LIFTING DEVICES

Welded Units Form Chain Hoist Support

A CONVENIENT and readily portable lifting derrick for supporting a chain hoist, particularly inside buildings not provided with overhead crane or other support capable of withstanding the added load, is made from two side supporting members, through which may be slipped a joint of drill pipe or extra heavy pipe cross member.

When dismantled, the derrick consists of three pieces, which may readily be handled by one man and transported in a pick-up truck. The two uprights and braces are of 2-inch pipe with foot pieces and head sockets of 3-inch. The 3-inch will take a 2-inch cross member, while if any of the smaller sizes of drill stem are used, the top or socket piece should be of a size to accommodate the drill pipe diameter.

To prevent slipping of the device when erecting or sustaining a heavy load, pins and holes drilled or burned through the outer ends of the transverse pipe may be used, this being especially desirable if the derrick be set on shifting foundation or blocking, where a slight jar might otherwise cause derangement of the device. With 2-inch pipe for cross member, the unit is amply strong for lifting pistons, cylinder heads and similar units.

Sliding central member permits support to be transported as three handy units.

AN IMPORTANT STATEMENT
from the MISSION MANUFACTURING COMPANY

To assist defense efforts by conserving steel, we urge users of Mission Pistons to send worn piston bodies to our factory for rebuilding, regardless of the amount of wear.

In most cases, the cost of rebuilding will be less than the cost of a new body. In those instances where the repair cost is greater, a new piston body will be furnished. We guarantee that factory rebuilt Mission Piston Bodies are equal to new in both strength and serviceability.

This statement suggesting piston body rebuilding is made for the purpose of cooperating with the national steel conservation program. We can furnish new piston bodies, but we feel that you will be pleased to have us point out another way to save steel.

We would appreciate word of this service being transmitted to field superintendents, tool pushers, and other interested field men. After all, it will take team work on the part of everyone to win this war.

- Send in your worn piston bodies for Mission factory rebuilding. The guaranteed, rebuilt bodies will be returned, transportation paid one way.

- Do not throw away worn Mission Piston Rubbers. They are made from high grade rubber, and will probably be needed, and reclaimed for national defense purposes.

MISSION MANUFACTURING COMPANY
Signed: WALTER B. SHARP, President

Houston, Texas, December, 1941

HIGHLIGHTS IN THE WEEK'S NEWS

War

Japanese Occupation Gets Small Borneo Field

First actual attempt of the Japanese to actually invade an oil-producing area of the East Indies, generally believed to rank equally with the tin and rubber supplies as their principal goals in the Pacific War, occurred last week. Attacks, which resulted in successful landing of troops, were made on the Miri and Seria (Brunei) fields of Sarawak and Brunei in the British Borneo section along the west coast of the Island of Borneo. Withdrawing British troops reportedly destroyed the oil fields and the one refinery in the region.

These fields have in the neighborhood of 500 producing oil wells, yielding a daily output of approximately 17,500 barrels or an annual production of roughly 6,500,000 barrels, most of which came from the Miri field. All the oil was refined at a plant located at Lutong. The Miri oil field and the refinery were operated by Sarawak Oilfields, Ltd., while Seria, 30 miles northeast of Miri, was a British Mayalan Petroleum Company, Ltd., operation. Both are subsidiaries of the Shell group.

The Miri and Seria fields are by no means the most important producing centers in the East Indies, but their geographic location made them more likely prospects for a Japanese invasion attempt. While the Japs no doubt had hopes of capturing the fields and the refinery in serviceable condition, the strategic location of the region was probably of more importance than the oil itself. The area, especially if they obtain a strong enough foothold, would serve admirably in the apparent Japanese plans for encirclement of the vital British naval port at Singapore and would make easier future attacks on other East Indies islands.

Other oil fields on the Island of Borneo, principally along the east coast controlled by the Dutch, produce about twice as much oil as does Sarawak and Brunei, their daily yield currently believed to be in the neighborhood of 34,000 barrels daily or about 12,500,000 barrels yearly. Total oil output of the East Indies, mostly belonging to The Netherlands (Dutch) government, is in excess of 180,000 barrels per day, or better than 67,000,000 barrels annually. The principal producing region is the Island of Sumatra, which currently is producing in excess of 110,000 barrels per day. Several other islands of the group also yield petroleum, primarily Java and Ceram. A number of refineries process practically all the production, a system of pipe lines moving the crude to scattered plants.

Venezuelans and Dutch Guarding Oil Properties

Extraordinary steps have been taken by the government to guard Venezuela's oil fields, harbors and airports from sabotage.

Because most of Venezuela's production is refined on the islands of Curacao and Aruba, and because continued operation of these plants is important to the British and American navies, protection for the refineries has been built up through most of the year. Last spring Holland appropriated 2,700,000 florins for defense of the Netherlands West Indies and Dutch Guiana. Numerous precautions are reported taken to protect the refineries. Discharge of workers suspected of pro-Axis sympathies, establishment of heavy guards to supplement those furnished by the government authorities, improvement of airports near oil fields and refineries and provision of military defenses around the plants are part of the defense programs.

An important phase of defense of the oil industry in the Venezuela area is the string of U. S. naval bases recently established in the Caribbean from the West Indies to Trinidad. One base is on Trinidad.

Japanese "Oil Specialists" Removed From Ecuador

A report last week from Guayaquil said Ecuador officials removed from the port of Esmeraldas six Japanese oil specialists employed by the Pacific Petroleum Company, holder of two large concession blocks on the Pacific Coast totaling about 1,000,000 hectares. It was said last week, as reported earlier in the year, that Japanese activities around Esmeraldas, only 550 miles from the Panama Canal, "were allegedly not confined to petroleum."

News Index

General:

Associations	50
Compact	50
Control	49
War	49
Washington	11
Markets-Statistics	53
Men in News	68
U. S. Field Operations:	
California	60
Completions	62
East Texas	56
Illinois	55
Kansas	55
Louisiana Coast	59
Michigan	61
Mississippi	60
Nebraska	60
North Louisiana	60
North Texas	56
Oklahoma	55
Rocky Mountain	61
Southwest Texas	58
Texas Gulf Coast	58
West Texas	55
Wildcat Development	66

Control

California Regulations Adjusted to War Needs

With the blessing of the Department of Justice and Coordinator Harold L. Ickes, California producers have been given a proration program designed to meet the state's needs during the war emergency.

Covering all phases of producing activities (see page 11), the recommended plan covers producing procedure in California fields and contemplates marked departure from established precedent as evolved under the state's voluntary conservation activities over the past 12 years.

At a mass meeting of producers in Los Angeles December 17, wholehearted approval of the proration program was given by the operators. While immediately effective, the plan will not become fully operative until January 1, proration rules formulated by the conservation committee to continue in effect in the meantime.

Conservation of the state's oil resources is to be given every consideration consistent with erquirements of the defense and war program, E. E. Pyles, chairman of the production committee for District 5, emphasized in presenting the plan, but primary emphasis for duration of the emergency is to be on supplying petroleum where and when needed by the armed forces and defense industry establishments.

Ickes has given every assurance that once the emergency is passed, full control of the California industry will be returned to private hands, Pyles stated. He pointed out that the committee he heads is charged with the responsibility of obtaining compliance and asked the producers present to be good soldiers so the industry can do a real job for the country.

The plan will affect not alone producers but owners, purchasers, handlers and marketers of oil products, to the end that compliance can be given enforcement when production is obtained in a manner contrary to the provisions of the plan. While not specifically stated, control of materials through priorities is expected to be used as a means of enforcing compliance with recommendations.

Pyles said California operators could expect a measure of regulation in the drilling of proven fields, but that exploration efforts would be given every consideration in allocating materials priorities. He announced the conservation committee was to be named as the standing sub-committee of the production committee in California. The state quota will be set by the coordinator and the production committee will handle distribution to fields and wells.

In manufacture of 100-octane aviation fuel, California crudes now supply 40 percent of industry's base stocks, it was brought out, and this volume can be increased 10 to 15 percent immediately by proper utilization of the state's

resources. Disproportionate allotments to fields producing crudes yielding higher percentages of desired critical products is contemplated in California, it was stated, and shortages of certain materials can be expected to lower octane rating of fuels for civilian consumption.

Should any transportation bottleneck develop, an effort will be made to restrict production at the well in order to prevent needless piling up of surface storage. All surface storage will be held strictly to the minimum needed for working stocks, according to present plans. Additionally, transportation has been complicated by removal of all tanker terminal inventories as a precautionary measure, and tankers henceforth will be loaded through inland tank farm pipe lines direct.

Texas Hearing Adjourned Pending Word From Ickes

An all-out effort to provide adequately for national defense was apparent among Texas operators attending the state-wide proration hearing at Austin last week.

Commissioner Jerry Sadler was still in Washington conferring with government officials. Chairman Ernest O. Thompson and Commissioner Olin Culberson were present.

A telegram from Robert E. Allen, director of production in the Office of Petroleum Coordinator, indicated that announcement of a national plan would be forthcoming within a few days. He suggested that the commission recess its hearing until "certain information essential to the Texas Railroad Commission for your hearing" could be furnished. Several days later the commissioners ware awaiting some definite word from Washington. Meanwhile, Commissioner Sadler had returned to Austin, had no definite comment to make, except that he expected something "within 48 hours." That was late Wednesday.

The need for more high-octane crude was stressed at the hearing Monday by D. W. Hovey, appearing for Republic Oil Refining Company, and other smaller refiners along the Gulf Coast.

He said they have been forced to turn down lease-lend contracts because they lacked sufficient quantities of this grade crude. He declared the small refineries would like to have definite assurance from the commission that requests of this type would be taken care of.

Rex Baker renewed Humble Oil & Refining Company's request for more low-cold-test crude, which also proluces some high-octane gasoline. He said the company is buying and producing 25,000 barrels of this oil daily, and needs approximately 10,000 additional barrels daily. The company is withdrawing from total crude storage at the rate of 26,000 barrels daily, and by the end of December will have approximately 11,600,000 barrels of oil in storage. It has 557,000 barrels of low cold test in storage, and Baker said, should have about 1,500,000 barrels.

Pure Oil Company reported that November withdrawals reduced its supply on hand at Smith Bluff refinery by five-days. Daily through-put is 52,000 barrels, purchases and production total 44,500 barrels, with a net decline of approximately 8000 barrels daily. Only a 7- or 8-day supply will be left on hand by January 1. The company asked for an increase of 75,000 barrels daily in the allowable for East Texas. It purchases about one twelfth of the oil allowed in that field. It would like to get the rest of its demand through an increase for the Van field in East Central Texas.

Compact

Compact Starts Survey of Reserves and Productivity

The Interstate Oil Compact Commission took its first step December 19 to key its activities to those of the Office of Petroleum Coordinator for Defense when it appointed a sub-committee of engineers and state conservation officers as a research and fact-finding group. First assignment was to make a survey of reserves, the ability of pools to produce without waste, and to classify the pools by character and quality of crude oil. This was regarded as emergency work and reports were sent immediately to all state regulatory bodies and the OPC.

The action came after Col. E. O. Thompson, chairman of the Texas Railroad Commission, warned that the industry probably would be forced to step production to near five million barrels daily by the end of 1942 and would be forced to greatly increase its stocks of all oils—particularly that of aviation gasoline. Before this, representatives of the eleven compacting states heard a warning from Burdette Blue, president of the Kansas-Oklahoma Division of the Mid-Continent Oil and Gas Association, that unless state regulatory commissions fell in line and enforced "honest conservation policies the door would be opened to federal restrictions—" which may continue long after our time."

Harold F. Bell, executive vice president of the Independent Petroleum Association of America, said industrial leaders and federal officials were becoming "too alarmed" over reports of premature abandonment of wells for salvage value. This practice really started in 1939, when the number of abandonments doubled those of 1938," he said. "If you'll remember, it was late in 1938 that the price of crude oil was reduced 20 cents a barrel."

Expect Record Winter Activity in Canada

Expectation of a winter of record activity in the Alberta production industry and a half-mile northward extension of the Turner Valley field is announced by the Alberta Petroleum and Natural Gas Conservation Board. A heavy winter drilling program for the northern Turner Valley extension area is anticipated.

In October, Major Oil Investments 3, one-half mile north of No. 2 in the valley, went on test, and went on steady production last month with initial production of 1548 barrels of crude daily from 8120 feet. No. 3 is the northernmost producer in the field. During October, 5 wells finished drilling in Turner Valley, 2 in the Princess field, 2 in Vermilion and 4 in other areas of the province. Of these wells, none went into production, although Royalite 57, finished in September, was completed for an initial daily production of 174 barrels.

Venezuelan Output Reaches New High During November

Production in Venezuela during November hit an all-time monthly peak of 750,000 barrels daily. This was an 8 percent increase over October. November output was 22,500,000 barrels. Venezuelan production has climbed every month since last March. On the basis of 11 months figures, the yield for 1941 will be about 220,000,000 barrels, a new record and 7 percent greater than 1939.

Exports during 1941 have averaged about 520,000 barrels daily as against 433,000 in 1940, when the course of war hit Venezuela hard. The major share of exported crued has gone to Aruba and Curacao.

Associations

Mid-Continent Association Holds Annual Election

General Mid-Continent Oil and Gas Association met December 15 in Tulsa and renamed all of its officers but one for the coming year.

Officers are: J. D. Collett, Fort Worth, chairman of the board; J. C. Hunter, Abilene, president; Robert S. Kerr, Oklahoma City, first vice president; Frank O. Prior, Tulsa, vice president for Oklahoma; Ralph Pryor, Wichita, vice president for Kansas; D. W. Harris, Shreveport, vice president for Arkansas-Louisiana; Van Welch, Artesia, vice president for New Mexico, and George Sawtelle, Houston, vice president for Texas (Sawtelle replaced Wallace Hawkins, Dallas).

Meeting in conjunction with the general group, the Kansas-Oklahoma division elected Burdett Blue, Tulsa, new president to succeed R. S. Kerr of Oklahoma City. Blue was president of Indian Territory Illuminating Oil Company before its merger with Cities Service Oil Company.

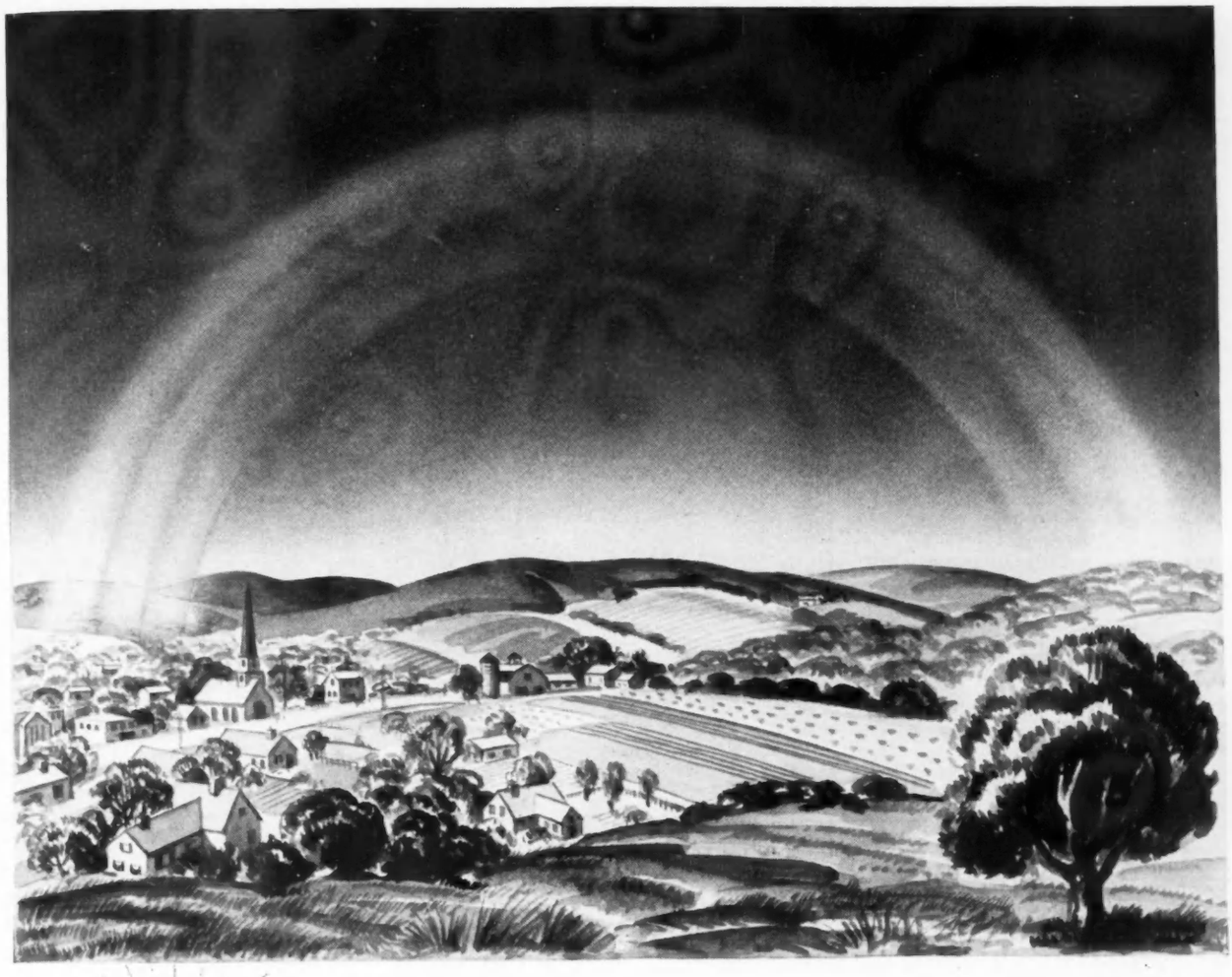
Other officers of the Kansas-Oklahoma division are: Lloyd G. Owen, vice president, Carter Oil Company, first vice president; E. B. Shawver, Wichita, vice president for Western Kansas; Carl Weiner, Chanute, vice president for Eastern Kansas; A. W. Ambrose, Bartlesville, vice president for Northern Oklahoma; Lloyd Noble, Ardmore, vice president for Southern Oklahoma; W. R. Wallace, Oklahoma City, vice president for Western Oklahoma, and Clarel B. Mapes, secretary.

Oil Scouts Association Cancels 1942 Convention

The National Oil Scouts and Landmen's Association will not hold its convention in 1942, the executive committee decided at a meeting in Dallas, Texas, December 13. The annual event was canceled because of the war.

The committee sent a telegram to President Roosevelt pledging support of the government in the war and offering the services of the association. Also, the committee voted to amend the association's by-laws to permit present officers to serve next year. The group decided that work will continue on the yearbook which will be issued next spring.

J. W. Selby of Houston, chief scout of Shell Oil Company, is association president.



We wish you Happiness

What is your idea of happiness?

Is it the peace of a contented fireside . . . the radiant glow of good health . . . the captivating smile of children . . . the joy of accomplishment . . . . or perhaps a compound of all of these?

Whatever it is, we wish it to you through all the days of 1942.

GASO PUMP & BURNER MFG. CO.

NO CRIMPING "FINGER PINCH" THAT SPOILS WIRE ROPE

When a Laughlin drop forged Safety Clip takes hold of wire rope, it means business. The solid fist-like grip is 50% more efficient than ordinary U-Bolt Clips, as proved by recent tests at a famous engineering school.

You also save the rope that would ordinarily be cut off after being crimped by the "finger pinch" action of U-Bolt Clips. Laughlin Safety Clips, when removed, leave the rope straight, uncrimped, ready to use again.

FEWER CLIPS NEEDED. Where you've been using four ordinary U-Bolt Clips, you will need only three Laughlin Safety Clips to get the same strength.

FASTER TO APPLY. Laughlin Safety Clips have nuts on opposite sides — easy to get at — you can use two wrenches at once. That saves time — and many a cuss-word.

Write for the free booklet giving results of tests made by a famous engineering school. Take the first step to saving some real money by mailing the coupon now.

THE THOMAS LAUGHLIN CO.
Portland, Maine W-16

Please send me free Safety Clip booklet.

Name.....

Company.....

Address.....

Check here for catalog on items below ☐

Look for Laughlin products in Composite Catalog and buy through your distributor.

Pipe Lines

456-Mile Southeastern Pipe Line Is Dedicated

The new 456-mile pipe line, built by Southeastern Pipe Line Company from Port St. Joe, Florida, to Chattanooga, Tennessee, was dedicated at Atlanta, Georgia, December 19.

Speakers at dedicatory ceremonies were Senator Walter F. George, of Georgia, and Congressman William P. Cole, Jr., of Maryland, chairman of the petroleum subcommittee of the United States House of Representatives.

Under the distribution plan which the line makes possible, refined products will be brought by tanker from Gulf Coast refineries to Port St. Joe, Florida, and piped to outlets in Georgia near Bainbridge, Albany, Americus, Macon, Griffin, Atlanta, Rome and Lookout Mountain station, near Chattanooga. The line will replace 22,000 tons of oil tankers, or 2.2 percent of those in use in American waters.

The line is equipped to transport approximately 30,000 barrels of gasoline daily. More than 31,000 tons of 8- and 6-inch pipe—or more than 60,000 pieces of pipe in 40-foot lengths—were hauled from supply bases and strung along the right-of-way. As many as 1200 men were employed on the project at one time.

Sinclair Building Short Line Out of Chapel Hill

Sinclair Refining Company has authorized immediate construction of a 10-mile 4-inch line from the Chapel Hill triple-pay oil and gas-distillate field, Smith County, to connect with its East Texas field trunk line system near Overton, Texas. Chapel Hill booster station will be erected immediately south of Sinclair Prairie's single oil producer, with 6-inch gravity gathering line due to be built the full length of the field as oil and distillate well connections become available. Field has 17 flowing oil wells in Pettit; 4 gas-distillate wells in Pettit and two each in Rodessa and Paluxy, besides dual completions. The new system will have capacity 4000 barrels daily, and is to be in operation January 15.

East Texas Gas Line

Lone Star Gas Company will lay 3½ miles of 4-inch pipe in connecting the recently discovered Tri-Cities gas-distillate pool, southwestern Henderson County, Texas, to its Cayuga field gas system. Development of the 7600-foot Rodessa pay is to follow as result of market for the gas being assured.

Atlantic Increasing Line Near Port Arthur Terminal

Atlantic Pipe Line Company will increase the capacity of its West Texas trunk line system from 38,500 to 41,000 barrels daily through replacement of an 8-mile section of 8-inch with 10-inch pipe between Atreco and Smiths Bluff (Beaumont-Port Arthur). The new unit will provide a continuous 10-inch from Midland to the company's Gulf Coast terminal, and will be in service by mid-January. Having failed to procure new pipe, the company filled its needs by purchasing 41-lb. 20-foot length screw pipe that was recently salved from a line that had been in service 18 years. The company has been operating its West Texas line at capacity for some months due to sharp boost in common-carrier business.

Bureau Report

Bureau Report Shows October Output at Peak

Topping the 4,000,000-barrel market for the first time in the history of the industry, daily average crude oil production in October reached 4,069,200 barrels, an increase of 87,700 barrels over the September average, bringing total output for the month to 126,145,000 barrels, it was reported December 19 by the Bureau of Mines.

The daily average for the month was 410,000 barrels a day greater than in October, 1940, and total production showed an increase of 12,727,000 barrels, it was disclosed.

The major part of the gain in production was in Texas with small gains in California, Kansas, Louisiana and other states offsetting a material decline in Oklahoma, the bureau said. Illinois daily output declined 400 barrels to 422,700 barrels the first drop since May. Coastal Louisiana, Kansas and Mississippi continued to break records. The bureau found that the gain in production out paced the increase in crude runs to stills, while exports of crude showed little change, with the net result that withdrawals from crude inventories were about 2,000,000 barrels less than in September.

Crude runs to stills increasing for the seventh successive month, averaged 4,089,000 barrels a day, 4000 barrels above September.

Because of the lack of important export data, the Commerce Department has not yet clarified its recent order relating to the publication of such figures. "The customary domestic demand for motor fuel for October cannot be obtained," the bureau explained. "However estimating the comparatively small imports, the total demand was about 61,000,000 barrels or 9 percent above a year ago. This gain was less than normal," probably because of curtailment in the Eastern States. This situation, plus the record-breaking output, resulted in a gain in stocks of over 2,000,000 barrels. As stocks declined materially in October, 1940, the total for October 31, 1941, of 82,303,000 barrels of finished and unfinished gasoline was several million barrels higher than the total on hand a year ago.

Department of Commerce, officials revealed that it is planned to surpress publication of all important export statistics for the period of the war.

Bureau of Labor Statistics figures placed the price index for petroleum and its products at 61.70 for October, the same as for September but well above the 49 of October, 1940.

The crude capacity represented by the data in the report was 4,600,000 barrels, giving an operating ratio of 89 percent, also the same as in September, compared with 82 percent in October of last year.

Production and Runs Heavy; Changes in Stocks Normal

The industry continues to produce and process crude oil in volumes around 15 percent or 500,000 barrels daily above a year ago, and thereby is well filling the current record-breaking demand for petroleum products, as attested by normal reactions of stocks. At least temporarily, withdrawals of crude oil from storage have been arrested.

Crude oil production in the United States was virtually the same in the week ended December 13 as in the previous week in averaging 4,109,550 barrels daily, and that output was 530,600 barrels daily (14.8 percent) above the production of 3,578,950 barrels daily in the corresponding week last year, but 30,000 barrels a day less than the demand, as forecast by the Bureau of Mines.

Refinery runs averaged 3,997,000 barrels daily in the week of December 13, up 52,000 from the previous week and 505,000 barrels (14.5 percent) above a year previously, when throughput was 3,492,000 barrels a day.

Stocks of finished and unfinished gasoline were increased a little over a million barrels in the week of December 13, whereas less than half a million barrels were added in the corresponding week last year. At the new level of 87,422,000 barrels, the stocks were almost 7,000,000 barrels (8.2 percent) greater than a year previously. On the East Coast the present stocks of 19,675,000 barrels are 2,629,000 barrels above those held a year ago, and Appalachian stocks are up 108,000 barrels at 3,365,000, while the Indiana-Illinois-Kentucky region shows a 2,121,000 increase to 15,802,000 barrels. Oklahoma-Kansas-Missouri district holds 1,302,000 barrels more than a year ago (8,011,000 barrels now), Inland Texas 715,000 barrels more (2,413,000), and the Rocky Mountain area 188,000 barrels more (1,161,000). On the other hand, California has 334,000 barrels less gasoline than a year ago, with 15,331,000 barrels on hand, while the Texas Gulf Coast has 22,000 less (13,167,000 barrels), the Louisiana Gulf Coast 114,0000 less (2,619,000), and North Louisiana-Arkansas 25,000 less (478,000).

Gas oil and distillate fuel stocks were seasonally reduced more than a million barrels between December 6 and December 13, but the total of 52,809,000 barrels left in storage was over 8,000,000 barrels (18.5 percent) in excess of storage a year earlier. Inland Texas and the Louisiana Gulf Coast were the only districts where light fuel oils went into storage during the week. The East Coast took 760,000 barrels out, but in retaining 21,146,000 barrels had 5,642,000 barrels more than the 15,504,000 barrels a year before. California withdrew 202,000 barrels, but still held 12,693,000 barrels, which was over 2,500,000 barrels more than a year previously. The Appalachian region has 626,000 barrels against 513,000 a year ago, and Indiana-Illinois-Kentucky 5,433,000 against 4,756,000. Oklahoma-Kansas-Missoui and Inland Texas also have more of the light fuels in storage than a year ago, as does the Louisiana Gulf Coast, but the Texas Gulf Coast has 1,584,000 less in holding 6,920,000 barrels, while small decreases are shown for North Louisiana-Arkansas and the Rocky Mountains.

A welcome addition to stocks of heavy fuel oils occurred, as the total rose from 95,342,000 to 95,762,000 barrels, although the latter quantity was materially lower than that held a year before, in reflection of withdrawals in California. Present stocks of 62,585,000 barrels in California are almost 10,000,000 barrels smaller than those held a year ago, and there was a 206,000-barrel reduction for that state in the week ended December 13. The East Coast, in contrast, added 658,000 barrels within the week and then held 1,363,000 barrels more than a year before, with 12,809,000 in the tanks. The Indiana-Illinois-Kentucky district took 142,000 barrels from storage but still had 1,312,000 barrels more than a year previously, with 4,258,000 on hand. The Texas Gulf Coast added 147,000 barrels but had 343,000 less than a year earlier, with stocks totaling 8,153,000 barrels. Small withdrawals within the week and decreases from a year previously were registered in the Oklahoma-Kansas, Inland Texas, North Louisiana-Arkansas, and Rocky Mountain districts. The Louisiana Gulf Coast added 17,000 barrels and with 2,348,000 on hand had 136,000 more than a year before.

Crude oil stocks were increased from 242,884,000 to 244,200,000 barrels during the week ended December 6, and the latter figure compared with 261,652,000 for the corresponding date a year ago.

Trends of Operations and Changes in Stocks

Figures are from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines' basis, except those on crude stocks, which are from Bureau of Mines weekly reports.

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	FUEL OIL STOCKS	
					Gas Oil & Dist. Fuels	Residual Fuel Oil
1939:						
April 22	3,526,700	3,280,000	277,156,000	[3]87,769,000	21,085,000	105,035,000
April 29	3,568,200	3,405,000	[7]278,440,000	86,794,000	[7]25,844,000	[7]108,409,000
May 6	3,580,900	3,275,000	[2]278,607,000	86,216,000	26,167,000	108,597,000
August 5	[2]3,909,400	3,445,000	268,982,000	76,431,000	35,601,000	114,512,000
August 26	[5]1,690,800	3,475,000	246,982,000	73,475,000	37,722,000	116,237,000
October 7	3,435,850	3,505,000	231,564,000	[6]71,152,000	38,549,000	114,397,000
October 21	3,771,550	[2]3,650,000	[3]229,127,000	72,122,000	39,358,000	115,060,000
1940:						
January 27	3,611,600	3,470,000	237,339,000	87,914,000	27,407,000	103,015,000
February 24	3,732,100	3,490,000	240,836,000	96,719,000	25,390,000	103,419,000
March 30	3,841,250	3,585,000	250,561,000	101,370,000	23,778,000	105,081,000
April 20	3,858,550	3,535,000	254,881,000	[1]102,817,000	24,779,000	103,323,000
April 27	3,845,250	3,555,000	256,670,000	102,452,000	24,997,000	102,552,000
May 25	3,835,650	3,580,000	259,330,000	100,297,000	28,356,000	104,015,000
June 22	3,846,450	[2]3,690,000	260,891,000	97,276,000	32,751,000	104,683,000
June 29	3,639,550	3,625,000	262,059,000	95,142,000	33,590,000	104,486,000
July 27	3,690,400	3,555,000	262,579,000	90,173,000	38,981,000	105,924,000
August 31	3,501,350	3,575,000	265,865,000	85,393,000	44,766,000	108,774,000
September 28	3,799,950	3,600,000	263,609,000	82,273,000	47,986,000	108,450,000
October 26	3,640,300	3,565,000	262,746,000	80,891,000	48,893,000	108,475,000
November 9	3,584,200	3,510,000	261,631,000	[6]79,847,000	48,408,000	107,687,000
November 30	3,335,050	3,510,000	262,679,000	80,284,000	46,212,000	106,618,000
December 28	3,385,500	3,585,000	261,552,000	83,274,000	42,266,000	102,620,000
1941:						
January 25	3,599,100	3,625,000	260,093,000	88,762,000	39,039,000	100,297,000
February 22	3,629,650	3,590,000	261,783,000	95,812,000	34,381,000	98,631,000
March 29	3,746,550	3,625,000	266,187,000	[2]99,727,000	29,949,000	96,152,000
April 26	3,726,850	3,675,000	266,149,000	96,647,000	29,543,000	94,732,000
May 31	3,786,100	3,699,000	262,356,000	93,845,000	33,524,000	92,757,000
June 28	3,847,250	3,930,000	259,399,000	91,461,000	35,732,000	92,896,000
July 26	3,869,950	3,920,000	252,728,000	86,945,000	40,197,000	93,855,000
August 30	4,004,700	4,070,000	249,413,000	81,672,000	45,351,000	95,052,000
September 27	4,060,000	3,980,000	246,649,000	81,003,000	49,950,000	95,251,000
October 4	3,860,750	4,015,000	246,144,000	[6]80,870,000	49,553,000	96,016,000
October 18	4,110,550	[4]4,120,000	243,605,000	82,584,000	52,403,000	95,800,000
October 25	4,098,800	4,060,000	242,261,000	83,343,000	53,183,000	95,295,000
November 15	4,086,850	4,010,000	240,399,000	83,412,000	[3]54,983,000	95,993,000
November 22	[4]4,336,850	3,995,000	241,956,000	84,579,000	54,396,000	95,982,000
November 29	4,086,000	4,115,000	242,884,000	85,525,000	54,141,000	95,971,000
December 6	4,107,950	3,945,000	244,200,000	86,356,000	53,946,000	95,342,000
December 13, 1941	4,109,550	3,997,000	.....	87,422,000	52,809,000	95,762,000
December 13, 1940	3,578,950	3,492,000	[4]261,652,000	80,769,000	44,598,000	102,517,000
Amount of change in past year	+530,600	+505,000	—17,452,000	+6,653,000	+8,211,000	—6,755,000
Percent change in past year	+14.8	+14.5	—6.7	+8.2	+18.5	—6.6

[1] All time peak. [2] Peak for year. [3] Lowest since April, 1922. [4] Stocks, December 7, 1940.
[5] Lowest since October, 1922, due to shut down of six Mid-Continent states. [6] Lowest for year.
[7] Prior to April 29, 1939, data did not include stocks at terminals, in transit, etc., except in California.

Markets Firm But Prices Remain at Fixed Levels

Markets of the industry continue generally firm, with prices almost wholly unchanged, although both producers and refiners are agitating for government approval of increases to compensate for further substantial rises in costs of producing and processing crude.

Refiners of the Gulf Coast, through their association, the Gulf Coast Refiners' Association, have submitted to the Office of Price Administration a brief in which they cited rapid ad-

vances in the cost of natural gasoline as primarily responsible for higher cost of manufacturing motor fuel.

The association declared that whereas the ceiling for 80-octane gasoline on the Gulf Coast had been increased 8-1/3 percent since mid-July, from 6 to 6½ cents a gallon, there had been meanwhile an increase of 58.5 percent in the cost of Grade 26-70 natural gasoline, which more than offsets the permitted ½-cent raising of the ceiling. Shortage and high cost of natural gasoline reduces consumption of natural as a blending agent, the association stated, and necessitates increased use of tetraethyl lead.

Payments of premiums for crudes that yield high-octane motor fuel also have increased manufacturing costs, according to the association, as have wage increases of 15 to 20 percent paid by Gulf Coast refiners in the past 6 months.

The refining division of the industry meanwhile has been seriously concerned over the scheduled rationing of tetraethyl lead, which will hold deliveries in the next several months to about 80 percent of normal, it is presently indicated, although Ethyl Gasoline Corporation is negotiating with OPM on the company's proposition of developing additional sources of pig lead for making the anti-knock fluid by paying higher prices for its supplies and thereby inducing operation of "marginal" lead mines. The company has shown that the cost of pig lead is only a practically negligible factor in making tetraethyl lead. However, from ½ to 1 pound of steel will be needed for each pound of production of pig lead, it is stated, and scarcity of steel may be an obstacle. Consequently, OPM is reported tentatively to have favored curtailment of civilian use of lead.

The scarcity of natural gasoline and tetraethyl lead already has had the effect of forcing downward revision of octane specifications for the several grades of gasoline, with the octane rating of regular grade now generally cut to 72 ASTM in the Mid-Continent and the Middle West.

OPM Frowns on Payment of Bonuses

The payment of crude premiums without official approval has been declared an unauthorized price increase, according to J. K. Galbraith, assistant administrator in the Office of Price Administration. The ruling was made in reply to a request filed by a substantial independent crude buyer in the East Texas field after losing numerous well connections to local refiners that pay price bonuses, ranging up to 10 cents per barrel. The ruling follows:

"It is our opinion that the purchase by any company of oil at a price in excess of the posted price for that oil on November 7, 1941, regardless of whether it is called a premium price, or an increase in posted price, would constitute an unauthorized price increase, unless the purchaser had obtained the approval of this office in advance of contemplated increase."

Production Near Peak as Texas Sets New Record

United States crude oil production shot upward in the week ended December 20 and almost reached the all-time peak of late November in averaging 4,314,950 barrels daily, as Texas turned out more oil than in any other week in all its history. The output of the wells of the nation was almost exactly 200,000 barrels a day greater than in the previous week, and for the 7-day period, market requirements for domestic crude were overproduced by 175,000 barrels daily, as the Bureau of Mines estimated daily average demand in December at 4,139,000 barrels. The greatest crude production so far recorded was that of 4,336,850 barrel sdaily in the week ended November 22, this year.

Last week's high production rate, like that of the November 22 week, reflected one more producing day than usual in Texas, that state's fields having been closed down only on December 14, whereas they usually are shut in two days a week. Texas production consequently jumped to 1,708,600 barrels daily, a new high for the state, topping by about 15,000 barrels the previous peak of a month ago.

California last week averaged 652,300 barrels daily, down about 17,000, and Oklahoma was virtually unchanged at 415,200. Illinois declined 4,000 barrels to 380,000, and Kansas was off about 4,000 barrels to 251,600, while Louisiana was up about 1000 barrels to 359,050 daily.

United States Crude Oil Production Close to Peak

Estimates Compiled by The OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (Dec.)	State Allowable (Barrels Daily in Dec.)	BARRELS DAILY FOR WEEK ENDED Dec. 13	Dec. 20
TEXAS:				
Texas Panhandle	.....	.....	88,000	98,500
North Texas	.....	.....	108,200	108,600
West Central Texas	.....	.....	31,500	31,500
West Texas	.....	.....	291,400	339,700
East Central Texas	.....	.....	84,500	92,200
East Texas Field	.....	.....	369,500	441,400
South Texas	.....	.....	216,300	256,300
Texas Gulf Coast	.....	.....	293,200	340,400
Total Texas	1,479,700	1,500,760§	1,482,600	1,708,600
CALIFORNIA:				
Long Beach	.....	.....	39,000	39,100
Midway-Sunset	.....	.....	55,000	48,900
Kettleman Hills	.....	.....	38,000	37,500
Wilmington	.....	.....	90,500	87,800
Others	.....	.....	446,500	439,000
Total California	635,800	613,200*	669,000	652,300
OKLAHOMA:				
Oklahoma City	.....	.....	72,150	75,300
Seminole Area	.....	.....	110,750	110,956
Others	.....	.....	233,075	228,944
Total Oklahoma	460,000	428,000	415,975	415,200
ILLINOIS:				
Salem	.....	.....	68,100	67,500
Louden	.....	.....	59,000	60,000
Centralia	.....	.....	8,600	7,550
Other New Pools	.....	.....	237,050	234,550
Old Pools	.....	.....	11,450	10,400
Total Illinois	426,500	.....	384,200	380,000

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (Dec.)	State Allowable (Barrels Daily in Dec.)	BARRELS DAILY FOR WEEK ENDED Dec. 13	Dec. 20
LOUISIANA:				
North Louisiana	.....	.....	81,400	81,650
South Louisiana	.....	.....	276,400	277,400
Total Louisiana	340,000	354,705	357,800	359,050
KANSAS	260,700	264,000	255,950	251,600
NEW MEXICO	116,100	117,000	116,800	116,700
EASTERN STATES:				
Pennsylvania Grade	73,900	.....	74,950	75,650
Others, Eastern	23,000	.....	18,500	18,500
Total Eastern States	96,900	.....	93,450	94,150
MOUNTAIN STATES:				
Wyoming	81,900	.....	85,200	85,850
Montana	20,700	.....	21,300	22,350
Colorado	5,800	.....	5,400	5,150
Total Mountain States	108,400	.....	111,900	113,350
MICHIGAN	52,300	59,950†	53,450	56,850
INDIANA	19,700	.....	19,900	18,600
ARKANSAS	76,500	75,297	73,700	73,550
MISSISSIPPI	60,300	.....	74,700	70,000
NEBRASKA	6,100	.....	5,950	5,000
‡Total 8 Prorated States	3,421,100	3,412,912	3,425,275	3,633,850
Total United States	4,139,000	.....	4,115,375	4,314,950

* Recommendation of Conservation Committe of California Oil Producers.

† No definite state allowable fixed under prescribed regulations; figure shown here represents daily average production in 4 weeks ended November 22.

‡ Texas, California, Oklahoma, Louisiana, Kansas, New Mexico, Arkansas, Michigan.

§ Calculated daily average of actual production at beginning of month, allowing for under production of 3½ percent below net allowable, which was figured at 1,555,192 barrels daily as of December 1. However, allowable normally increases as new wells are completed, and consequently, actual daily average production for month may be expected to be slightly greater than average as calculated December 1. Under December order, most Texas fields were ordered shut down December 6, 7, 13, 14, 21, 25, 28 and 30.

U. S. FIELD OPERATIONS

Illinois Basin

Wayne County Wildcat Initials 300 Barrels

Richland County wildcat a half mile south of Olney finds McClosky saturation; opening of new field assured in Wayne County; Roland field extended north; second well in new Clay County pool; outpost to Hamilton County's Rural Hill field nears completion as producer.

Richland County: Benedum - Trees' Powell 1, E½ NW SE 10-3n-10e, a half mile south of Olney, cored McClosky saturation at 3146-59 ft which on a drill stem test open one hour showed 180 ft oil, 45 ft oily mud and 540 ft of salt water. Nearest production is north of Olney; a successful completion probably would cause a townsite drilling campaign.

Wayne County: Texas Co.'s Talbert 2, C S½ SW SE 17-1s-6e, offset to a disappointing wildcat three miles south of Johnsonville field, flowed 300 barrels natural in 24 hours from McClosky and Lower O'Hara. It is a west offset to Kingwood's O'Neal 1 which showed for pool opener several weeks ago in McClosky and then was unsuccessfully tested in that formation; O'Neal 1 has been plugged back to Aux Vases sand for test.

The basin's most closely watched wildcat, N. V. Duncan's Guthrie 1, C N½ N½ SW 35-1n-5e, five miles west of Johnsonville field, drilling in Rosiclare at 3020 ft.

White County: A half mile north extension of the Roland field appeared assured as casing was set at Cameron Oil Co.'s Deboard 1, SE NE NE 2-7s-8e, to test Benoist topped at 2833 after plugback from dry Aux Vases.

Cameron's Reilling 1, a wildcat between Rising Sun and Storms fields, SE SE SE 21-6s-10e, drilling below 2375 after finding water in Tar Springs.

W. C. McBride's Daly 1, C N½ SW SW 7-4s-10e, three fourths of a mile southwest of East Centerville pool, flowed 400 barrels in 24 hours, 3 percent water, pinched in and tools in hole; well is McClosky producer whereas production at East Centerville is confined to Tar Springs.

Clay County: Pure's L. A. Pearce 1-A, C S½ SW NE 10-2n-7e, second producer in new field a mile and a half west of Clay City pool, flowing natural from McClosky and appears as good as discovery which was initialed at 3710 barrels natural. There are eight other operations in the area.

Jasper County: Craft and Powers Wade 2, C E½ SW NW 5-5n-14w, second prospective producer in new field near Ste. Marie, testing McClosky.

Hamilton County: Dave Ring's Craddock 1, NE SE NE 22-6s-5e, three fourths of a mile southwest of Rural Hill production, swabbed 35 barrels of oil in two hours after 320-quart shot in Aux Vases at 3188-3210 and 3211-25; G. C. Curtis and Heath's Foster 1, SE SE SW 15-6s-5e, perforating Aux Vases after unsuccessful test of McClosky and Rosiclare which showed water. It also is an outpost to the field.

Indiana

Pike County: Dawson-Steed's John Patberg 1, SW NW NE 16-3s-7w, wildcat west of Stendal, initialed 125 barrels on pump from Cypress sand at 1143-51 ft; bottom 1151 ft.

Vanderburgh County: Completed for estimated initial of 30 barrels a day was a wildcat five miles southwest of Evansville, A. B. Settle's Bert Edmonds 1, SE SW NW 16-7s-11w, pumping from Waltersburg pay at 1645-57 ft.

Sullivan County: Sun's Queen 1, C NE SE 17-6n-9w, pumped 45 barrels of oil and some water in 24 hours from McClosky at 1325-29 ft; new pool.

Oklahoma

Seventh Producer In at Apache

Seventh Apache pool producer completed; Caddo County deep test cores saturation; Logan County wildcat attracting attention; big gasser added in Chickasha field; Pottawatomie County activity continues brisk.

Caddo County: Texas Co.'s Smith 5, NE SW NW 2-5n-12w, seventh producer for Apache field, extends area one location west, drilled to 3490 ft in Wilcox sand topped 3373 ft, well flowed 248 bbls oil in 1 hr through 3-in line, then pinched to 1-in choke flowed 114 bbls in hr test. Operator's Mulkahay 2, NE NW SE Sec. 2, on southeast flank of field, cored to 3671 ft, not revealing Wilcox top and was running 7-in Amerada Petroleum Corp.'s Sprague 1, C SE NW 11-8n-12w, deep wildcat near Fort Cobb, cored 9451-61 ft in sandy-shale, believed Pennsylvanian, recovered 2 ft of sand spotted with saturation showing heavy black oil and some gas, to take drill-stem test, contract depth 10,000 feet.

Logan County: Cities Service Oil Co.'s Babcock 1, SE NE NE 10-15n-4w, near Navina, watched as it looks for Wilcox sand, test topped Simpson dolomite at 6435 ft, runing 100 ft high to nearby failure which had slight show in Wilcox sand.

Grady County: Sinclair Prairie Oil Co.'s Charlson 7, C SE SE 22-5n-8w, on northeast flank of Chickasha field, drilled to 4113 ft, over 60 ft higher than highest well in field, spring gauge showed 150,000,000 gas daily, shut in pressure 1840 lbs.

Pottawatomie County: W. O. Allen's Webber 1, NEc 27-9n-4e, extends Hotulke pool location west, plugged back to Hunton lime from wet Wilcox sand, perforated 4155-75 ft, acidized 6000 gals, flowed 400 bbls oil in 18 hrs; operator's Webber 2, drilling 4250 ft. C. W. Sharp's Hudson 1, NW NE NE 28-9n-4e, plugged back from Wilcox sand, perforated 4460-4502 ft in Viola lime, acidized 2000 gals, installing pump with hole full of oil, producer inside pool proper.

Kansas

New Pools Opened in Barton and Cowley

New Bartlesville sand pool for Cowley County; active Peace Creek pool gets another extension; new pool for Barton County and extension of new area.

Cowley County: Trees Oil Co.'s Deichman 1, SWc NW 24-31s-4e, 2 mi east of Hittle pool, has opened new Bartlesville production; drilled only 1 ft into the sand topped at 2835 ft, well flowed 200 bbls oil in 24 hrs natural, testing. Nearest Bartlesville production in David pool 3 mi south.

Reno County: Cities Service Oil Co.'s Krey 1, NE NW NW 22-23s-10w, has extended Active Peace Creek pool ¼ mi southeast, the well was completed for a maximum producer at 3805 ft, in Viola lime, top not reported. Last week saw two major extensions to the field.

Barton County: Sinclair Prairie Oil Co.'s Kowalsky 1, C NL NE SW 32-20s-11w, has opened a new producing area 3 mi southeast of Silica pool, well drilled to 3408 ft in Arbuckle lime topped at 3398 ft, well filled 1800 ft with oil, acidized with 5000 gals, pumped 89 bbls oil and 9 water in 9 hrs, waiting on potential. Skelly Oil Co.'s Michalis 1, NEc 30-16s-13w, extends new, unnamed Barton County pool one location west, well topped Arbuckle lime at 3384 ft, drilled in 2 ft, acidized 3000 gals, pumped 85 bbls oil in 5 hrs, testing.

Pratt County: Falcon-Seaboard Drilling Co.'s Randle 1, C E½ SE NE 28-28s-13w, 10 mi southwest of Iuka pool, drilled to 4460 ft in Arbuckle lime after logging favorable show in earlier core 4517-24 ft in lime topped at 4512 ft, failed to show commercial possibilities, now plugging back for Viola lime test.

West Texas

Slaughter Will Drill As Pipe Will Allow

Drilling of inside locations in Slaughter field to be accelerated. Prospective oil discoveries in Pecos County deepening, and Crockett County semi-wildcat rated as small pumper. Exploratory work gaining.

Slaughter: Magnolia authorized 39 new tests, including 13 on Mallet A and 16 for Mallet B leases. Unless restrained by pipe shortage, or transportation difficulties it is now evident that all inside locations in this large field to be drilled. Honolulu and The Texas Co. also engaged in major drilling campaign, while Stanolind now tapering off. Latter procured market for 3000 bbls daily allowable through contract with Humble, with oil moving via Texas-New Mexico line to Midland, thence via Atlantic to Hearne, where deliveries made to Humble.

Upper Plains Wildcats: Stanolind's Williams 1 and Anderson-Prichard Oil

Corp. et al's Ellwood 1, both Hockley County, drilling at 4800 ft and 5780 ft, respectively. In Briscoe County, Phillips Petroleum Co.'s Montague 1 drilling hard chert 6135 ft, having yielded sulphur water at 5502-27 ft. Geo. Callihan et al's Whalenmaier 1, Crosby County's strongest bid for production, to drill out plugged-hole from 2930 ft to 3000 ft for third nitro shot after yielding nominal volume free oil from Clear Fork, topped at 3370 ft, and drilled to water at 4054 ft.

Big Flow: C. O. Davis et al's Judkins-Atlantic 3, east edge of Foster field, became biggest well in Ector County in establishing potential 12,710 bbls oil, based upon 6-hour gauge through open 7-in casing and 2-in tubing natural. Production from regular lime 4255-4385 ft. Previous field record made by Broderick & Calvert on lease adjoining to west. Oil Well Drilling Co.'s Johnson-Shell 1, Ector County wildcat between Goldsmith and Harper fields, unloading for production test at 4510 ft, 7-in 3952 ft, with broken saturation 4395-4430 ft. Topped lime 3870 ft, elevation 3064 ft.

Reagan County: Amerada's University 1-R-B, ¾-mile southwest of its Ellenberger oil discovery in Barnhart area, preparing to acidize through 70 perforations 9120-40 ft, plugged back from 9230 ft to 9173 ft, 5½-in 9220 ft. Entered Ellenberger near 9000-foot level, being low to discovery.

Pecos County: Gulf and L. H. Wentz's Millar 2, which has been showing for a discovery for several weeks at unusually great depth in Ellenberger, topped 4157 ft, elevation 2534 ft, flowed 131 bbls oil after recovering acid load, with gas volume rated at 1,989,000 ft daily. Hole is bottomed at 4383 ft, 7⅝-in 4282 ft. No water appeared during above test, and hole may be deepened. Area involves steep Ellenberger structure and closely related to granite ridge.

Pure Oil Co.'s T. P. Land Trust 1-A, extreme western Pecos County wildcat, drilling fine sand with shale streaks 5396 ft, carrying 700 ft oil and 4200 ft water, having filled with water at 5370 ft in Delaware sand, topped 5082 ft, elevation 3311 ft. In Abell field, Magnolia's Erickson-State 1, west offset to Stanolind's 3950-ft Permian oil discovery, cemented 7-in on bottom at 3960 ft, drill stem test at 3838-3960 ft yielded 750 ft sulphur water and small amount free oil. Best porosity logged 3845-3900 ft, with oil-stained lime to 3947 ft.

Gaines County: Amerada's Hudson 1, 3 miles west of south edge of Wasson field, failed to materially increase production outlook in deepening from 5000 ft to 5016 ft, where swabbing test yielded 5 bbls oil and 16 bbls water daily. Likins & Hall's Jones 1, projected Clear Fork test for northwest portion county, drilling hard lime 6360 ft.

Semi-Wildcat: Humble's Owens 1, 1½ miles northwest of the Clara Couch pool 2186-ft flowing discovery, pumped 76 bbls oil the first 14 hours of official test, used 6000 gallons acid 1905-2003 ft.

North Texas

Clay County Wildcat Flows Natural From Bend

Northeastern Clay County well flows natural from Bend. Montague County wildcat finaled, and testing scheduled for prospective discoveries in Denton and Wise Counties.

Clay County: Continental Oil Co.'s Spring 1, NE NW NW H&TC Sec 24, Blk 4, opened Bend conglomerate pool 3 miles northwest Ringgold deep area with a deep failure separating same, in flowing 115.8 barrels 48-gravity oil 8 hours natural through 28/64-inch tubing choke. Production from limey-conglomerate 5586-5630 ft in Bend, topped at 5576 ft, being 76 ft high to Walter Gant's Stine 1, which abandoned in Ellenberger. Superior Oil Co.'s Scaling 1-A, SW NW HT&B Sec 2, western Clay County wildcat, awaiting orders in Ellenberger 5865 ft without shows.

Montague County: Continental's Winder 1, recent wildcat strike 2 miles east of Stoneburg, finaled with natural flow 464 bbls 44.8-gravity oil initial ¼-in, gas volume rated 395,000 ft daily, perforated 20 shots 6233-41 ft after plugging back from 6610 ft to 6442 ft. Production from conglomerate 6234-45 ft in Bend, topped at 6039 ft.

Wise County: Hunt Oil Co.'s Holman-Pure 1, Chico geophysical prospect, logged oil saturation 5660-75 ft in Bend, topped 5480 ft, and drilling shale 5690 ft; Stack 1, mile northwest Chico, drilling shale 3610 ft.

Denton County: Hunt Oil Co.'s Jones 1, northwestern part of county, preparing to test Ellenberger dolomite 5535-5633 ft, with 5½-in 5520 ft, before perforating promising oil zone passed up in Bend, topped at 4085 ft. Basal Bend conglomerate 5322-30 ft, and 5363-84 ft considered capable of making producer. Company's Jones 2 drilling 2100 ft to test Canyon section.

Jack County: Hanlon & Buchanan, Inc.'s Hoefle 1-B, south offset to the Hoefle pool 4835-ft Bend discovery, awaiting test of broken saturation 4867-4906 ft, 5½-in 4869 ft. Top Bend 4867 ft, slightly higher structurally than discovery. Considerable drilling slated for area if production warrants same.

Throckmorton County: Humble's McKnight 2, ¼-mile south of its McKnight pool 4049-ft Bend discovery, swabbed 8 bbls oil and 67 bbls water 12 hours, used 500 gallons acid in Bend saturation 4042-60 ft; installing pump.

East Texas

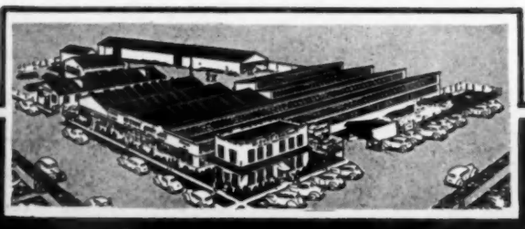
Paluxy Promises Small Pumper in Hopkins County

Paluxy prospect in Hopkins County promises small pumper. Casing set for test of Woodbine on Bazette faulted structure. Enlarged drilling program to follow new pipe line in Chapel Hill field. Wildcat failures include pair Paluxy tests.

Paluxy: W. B. Hinton and Talco Asphalt & Refining Co.'s Long 1, northern Hopkins County wildcat that has been testing for some weeks, pumped 8 bbls 21.5-gravity oil and 64 bbls water on initial gauge after cementing Lower Paluxy perforations. Production is from perforations 4740-48 ft. In Hunt County, Parsons Bros. et al's Marshall 1, northeast edge Commerce, awaiting orders with water in Paluxy 4922-5010 ft, elevation 534 ft.

Navarro County: Lyman Davis et al's Stevenson 1, latest test for Bazatte faulted structure, encountered promising producing sand 3090 ft in Woodbine, topped 3035 ft, elevation 409 ft, 5-inch cemented on bottom at 3120 ft in water sand.

Wood County: Humble's Brown 1-B, half mile south of townsite production at Hawkins, abandoned 4908 ft in Woodbine water sand.



McEVOY

COMPANY

"OIL WELL EQUIPMENT" SINCE 1906

TEXAS AT MILBY • HOUSTON, TEXAS • TELEPHONE C-2288

SEE McEVOY'S 20 PAGE SECTION IN YOUR COMPOSITE CATALOG

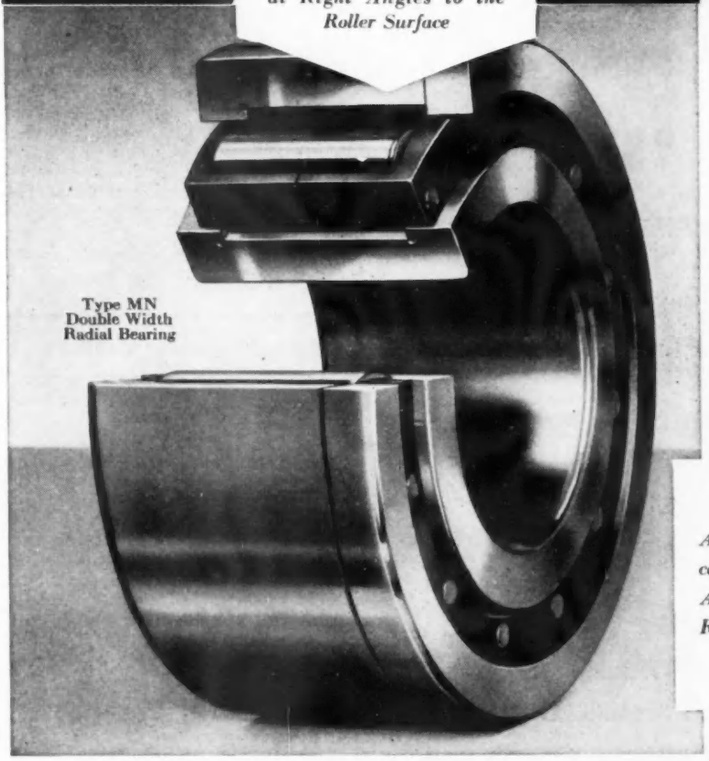
CHRISTMAS TREES
COUNTER HYDROSTATIC GAS LIFTS
SCREENS
PACKERS • SET SHOES

ROLLWAY'S

Right-Angled LOADING

assures compactness of design . . . longer bearing life . . . and higher speeds under heavy loads

All Radial Loads Carried at Right Angles to the Roller Surface



Type MN Double Width Radial Bearing

THEY'VE GOT WHAT IT TAKES FOR THE 168-HOUR WEEK

By splitting the load into its simplest components of pure radial and pure thrust, Rollway provides greater carrying capacity in a given space. Compactness of machine design is made possible. Wear is decreased. The friction load on each individual roller is lightened. And need for service attention is substantially reduced.

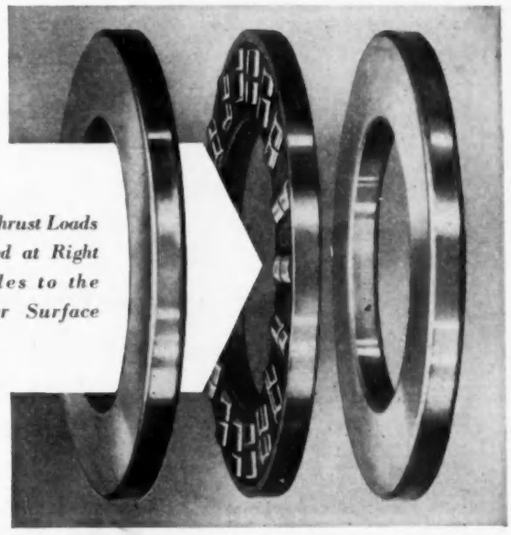
The sum of these advantages is reflected in longer bearing life, especially under conditions of high shaft speeds and heavy load . . . factors that are vitally important in today's 168-hour week and defense schedule speed-up.

For designs requiring simplified assembly to permit greater bearing area and capacity, Rollway double-width radial bearings with separable outer race not only simplify the mounting problem but greatly reduce wear even under extreme operating conditions. And they're specially constructed to absorb a relatively heavy locational thrust.

Send us your plans today for engineering analysis and bearing recommendations.

REMEMBER—*You can usually change over from other kinds of bearings to Rollways of higher load capacities without increasing boundary dimensions.*

Type T Single Acting Thrust Bearing



All Thrust Loads carried at Right Angles to the Roller Surface

ROLLWAY BEARING COMPANY, INC., SYRACUSE, N. Y.

BUILDING HEAVY-DUTY BEARINGS SINCE 1908 — BEARINGS

LOW-COST, COMFORT SAFETY

. . . OUR SERVICE TO YOU!

GENERAL HEADQUARTERS FOR INFORMATION on any trip or shipment is at your nearest SP office. The Agent gladly will furnish you with cost, schedules, routes, etc., as a helpful service to you, without obligation.

And, if you decide to choose our trains, you will enjoy *modern accommodations, low-priced tickets* and *on-time schedules!* We offer overnight and daylight service between principal Texas-Louisiana points and 4 great routes for transcontinental travel.

NEXT TIME, TRY "SP"!

3 TRAINS DAILY BETWEEN
HOUSTON *and* DALLAS

STREAMLINER SUNBEAM
265 Miles : 265 Minutes

STREAMLINER HUSTLER

OVERNIGHT OWL
(Sleeper - Bedroom Car - Galveston, Houston, Dallas)

TWO FAMED TRAINS DAILY
***Between* NEW ORLEANS-CALIFORNIA**
***Via* Lake Charles, Beaumont, Houston, San Antonio, El Paso**
SUNSET LIMITED • ARGONAUT

Southern Pacific

J. F. SULLIVAN—Pass. Traffic Mgr., "SP" Bldg., Houston, Texas

SHIP VIA "SP" **FREE PICK-UP AND DELIVERY SERVICE**

Southwest Texas

First Oil Field Indicated On Chittim Anticline

First commercial production on Chittim anticline was apparent as Wellington Oil Company was completing an outpost in a new horizon for the Chittim field in Maverick County. Previous shows have lent encouragement but nothing commercial. The discovery, Chittim 2, 2718 ft east of the field, drilled to 5711 ft, perforated 2966-3030 ft in Georgetown lime to flow 20 bbls hour 41.6-gravity pipe line oil, 30/64 choke; 465 lbs tubing and 675 casing pressure.

LaSalle County: Third producer in Washburn field, Quitana Petroleum Corp.'s Washburn 5, cored solid sand 5498-5559 ft, set 5-in 5539 ft, and flowed 470 barrels daily, ¼-in choke; 550 lbs tubing, 450 casings pressure.

Lower Coast: Sam E. Wilson et al's Land Bank 1-C, opened Bertram sand production on west flank of Stratton field, Jim Wells County, when 6-min drill-stem test at 6260-89 ft recovered 350 ft 31.3-gravity pipe line oil; ¼ and ⅜ chokes. Wilcox Oil & Gas Co. opened new sand at West Alfred, Jim Wells County, when Adams 2 made heavy flow gas, spray of oil when perf 4304-08 ft; 3/16 choke, 1620 lbs tubing, 1700 casing pressure.

Humble's Kent & Crane 1, Gilliland survey, Aransas County, topped oil sand 7444 ft, drilling 7687 ft.

Moore & Ahern's Badet 1 extended North LaWard field, Jackson County, mile southeast, flowing 80 bbls 25-gravity oil, perf 6216-19 ft; ⅛ choke, 355 lbs tubing, casing sealed; gas-oil ratio 191-1.

Starr County: Sun's Montalvo 1-C had a new sand 2 mi northeast Sun field; drill-stem recovered 268 ft oil, 20 ft mud, 40 ft salt water in 9 min; perf 6371-75 ft. This well reported 8 possible producing zones.

Texas Gulf Coast

New Field Discoveries Add to Coast's Reserves

Flurry of discoveries increase Gulf Coast reserves in Jefferson, Montgomery, Wharton Counties; Newton County wildcat find shows in Wilcox; Jefferson County wildcat flows gas, some oil.

Discoveries: Rapid development of Winnie (Stowell), Jefferson County, is promised with locations planned following completion of Glenn H. McCarthy's Crawford 1, which flowed 484 barrels 34.5-gravity oil in 24 hours through ¼-in. choke, perforations at 8850-80 ft in Frio, tubing pressure 775 pounds, casing 1600, gas-oil ratio 400-1. Field promises to be major discovery of year on coast due to thick sands in Frio and showings in Marginulina, not tested.

McCarthy, Brown & Wheeler have staked Englin 1, half mile north of discovery, located center of northeast 40-acres, Section 158. Sinclair Prairie Oil Co., large leaseholder, also is preparing to make location.

Wynn Crosby Drilling Co. is continuing production tests in Poole 1, Wil-

cox discovery in Lissie area, Wharton County. Well on initial test flowed 150 barrels 49.5-gravity oil from perforations 9655-81 ft, 2200 pounds tubing pressure, casing sealed, but a leak developed in packer and flow was halted to make repair. Wilcox was topped at 9415 ft, total depth 10,777 ft. Several deep wells have been drilled on prospect, all finding shows but not enough sand for commercial production. Crosby is large leaseholder in area, a discovery that is on strike with other Wilcox fields.

Atlantic Refining Co. is preparing to pump Foster 1-A, Cockfield sand discovery, Fostoria area, Montgomery County. After swabbing, well would flow 10 barrels fluid hourly, 20 percent salt water, oil 40-gravity, from perforations 5790-94 ft. Perforations were squeezed twice in attempt to shut off water. Drill-stem test showed 450 pounds pressure. Hole was drilled to 11,794 feet, and tests were made at 10,508-20 feet, 9090-95 feet, and 9126-36 feet in Wilcox, all showing salt water and some gas.

Newton County: H. C. Cockburn and H. L. Hunt's Texas A. & M. College 1, Bleakwood area, is drilling around 9000 feet after finding shows in top of Wilcox, topped at 8650 feet; at 8732-52 ft showed for production in top part with gas and distillate in bottom. Cockfield was topped at 5800 ft, Wilcox 8650 ft. Wildcat is in strike with other Wilcox fields in area.

Big Hill Wildcat: Stanolind Oil & Gas Co. has opened gas production with little oil in Anderson 1, north flank Big Hill dome. Through perforations at 8705-20 ft, flow was at rate 4,794,000 feet gas daily with 5 barrels 42-gravity oil through ⅛-in choke. Production is from broken Frio sands, showing 3550 pounds tubing pressure.

Fort Bend County: Atlantic Refining Co. is testing Grocez, second wildcat on east flank Nash Dome. Bottomed at 5216 ft; pipe was cemented at 4365 ft after running into heaving shale in sidetracked hole. Tests will be made in Miocene.

Placid Oil Co. is drilling below 7000 ft in Moore 1, Henry Scott survey, Rosenberg area. Electric survey was run to 5100 ft, checking 70 ft low to Magnolia's Huntington 1, drilled to 8698 ft in 1940 and which flowed gas and distillate. Placid's well is 3000 ft southeast of first wildcat. Latest well is on 2500-ac Magnolia farmout.

W. L. Goldstein has located Smith 1 in Needville area, recently opened to gas production with Coyle 1. Location is west of discovery, 800 ft from southeast line and 500 ft from southwest line of 100-acre tract, F. Mading survey.

Chambers County: Rowan Drilling Co. is due to test Land 1, wildcat on South Anahuac prospect, finding gas and possibly oil shows in Frio sands at 8300 and 8740-80 ft, bottom part of sands showing water. Contract depth is 9000 ft. Operators have staked Arthur Nelson 1, ¾-mile east of Land 1. Projected depth is 9500 ft, Humble holding east, west, and south offset acreage. Other deep dry holes have been drilled on prospect.

Brazoria County: Rowan Drilling Co. is extending Danbury Dome production westward with Jamison 15 testing. Depth is 4020 ft, plugged back to 3753 ft. Mechanical trouble has delayed completion.

Stanolind Oil & Gas Co. has staked Houston Farms 1 at Chocolate Bayou, being the company's first well in the field. It is located on 100-acre tract in Hooper & Wade survey, 1140 feet southwest of McCarthy's Triangle 1 gas-distillate producer. Projected depth is 10,000 ft.

Harris County: Atlantic has awarded contract to Morris-Hamilton Drilling Co. for Cohn 1, wildcat on west flank South Esperson field, Liberty County, projected to 8000 ft for test of sands producing on other flanks.

Louisiana Gulf Coast

New Well Projected After Lewisburg Discovery

New wildcat staked near Lewisburg discovery in Acadia Parish; Superior testing west flank well at Bayou Blue, Iberville Parish; new wildcats projected.

Discovery: Stanolind Oil & Gas Co. has staked a wildcat in the Lewisburg area, Acadia Parish, following completion of well that flowed gas and distillate. Discovery well, Tweedel 1, flowed 48 barrels 54-gravity distillate from perforations 10,140-50 ft through ⅛-in choke. R. Lee Mills 1, across line in St. Landry Parish, in Sec 14-7s-3e.

Iberville Parish: Superior Oil Co. is testing Schwing Lumber 1, opening production on north flank of Bayou Blue dome. On initial test well flowed at rate of 120 barrels oil through ⅛-in choke daily from perforations at 5024-31 ft before perforations sanded up. Production on north side of structure opens up considerable new acreage to development.

Cameron Parish: Superior extended Lakeside (Lowry) field half mile northward with Paggie 1 flowing 50 barrels 51-gravity oil daily through 16/64-in choke from perforations 9920-70 ft. Tubing pressure is 1200 pounds, casing sealed. Hole is bottomed at 11,059 ft, casing set at 10,020 ft.

Phillips Petroleum Co. is testing Miami 2, Sec. 12-14s-6w, Cheniere Ridge area, below 10,000 feet, exact perforations not announced. Well tested considerable gas and distillate, no oil. Heaters are due to be installed before completion. Hole is bottomed at 10,510 ft.

Avoyelles Parish: Materials are being moved to Placid Oil Co.'s S. W. Improvement 1, first of 2 Wilcox tests in Bordelonville area. Location is at center of NW NW 19-2n-7e.

Rapides Parish; Phillips Petroleum Co. and W. H. Marr's Eota 1, wildcat discovery in South Catahoula area, will be pumped. Well has been testing several weeks in Wilcox sand, failing to flow. Production is through perforations at 5150-52 ft.

Deep Tests: Shell Oil Co. has abandoned Federal Land Bank 3, semi-wildcat east of production in LaPice area, St. James Parish, at 11,852 ft, no shows.

Amerada Petroleum Corp. is drilling below 12,243 ft in St. Martin Land Co. 1, wildcat between Bayou Boullion and Section 28 fields, and located on St. Anthony Church prospect. Electrical log was run to 11,004 ft, no shows.

Terrebonne Parish: Fohs Oil Co. and Pilgrim Exploration Co. opened a new deep sand in Lake Long field with Octave Aucoin 1 flowing 415 barrels of 37.6 gravity oil daily through 13/64-in choke from perforations at 10,218-28 ft in a thick sand body. The well also extended production southwesterly. Hole is bottomed at 10,258 ft. The field now has 3 productive sands.

Assumption Parish: Peterson Petroleum Co. of New Orleans is reported planning to drill wildcat on south flank of Napoleonville dome on farmout from Sinclair Prairie Oil Co. George Echols and J. Ray McDermott recently drilled Armelise Planting 1 to 8897 ft on east flank, cored several sands, but too close on dome for production. Falcon-Seaboard drilled Simoneaux 1 on flank in 1940, going into salt before abandoning.

Greetings!

To our friends everywhere . . . may your Christmas be a merry one, and may the New Year bring a full measure of prosperity and happiness!

MECO

MAINTENANCE
ENGINEERING CORPORATION
P. O. Box 2637 Phone P-3135
HOUSTON, TEXAS, U. S. A.

North Louisiana

Olla Trend Work Still Active Despite Failures

Twenty-seven shallow tests planned by one company in Bellevue field; wildcat planned on north nose of Sligo structure, Bossier Parish; Olla trend activity continues despite six failures during week; La Salle Parish wildcat logs shows in Wilcox.

Bellevue: Premier Investment Co. of Fort Worth, which owns most of the shallow Bellevue field, plans series of 27 Nacatoch tests to average depth of 400 ft, to be followed by deep test.

Sligo: Barksdale field, army post believed on top of Sligo structure, Bossier Parish. On south side for several years both Pettit and upper-lower Cretaceous contact has been productive. Now on north nose of structure north of army post. Ward Delaney has taken 3000 acres around Section 20-18n-12w, for early test.

Olla Trend: Six failures were recorded last week in Olla trend with two others in process of abandonment but leasing and geophysical activity continue at high pitch. Tests abandoned in following parishes: Caldwell, one; Catahoula, three; Concordia, one; LaSalle, one. Tests arranging to abandon: LaSalle, one; Catahoula, one. N. Hobson Wheless moving from abandoned test in Section 3-5n-3e, to another test on block around Section 36-7n-5e. Wheless has several blocks in Olla trend in all of which Carter and Phillips own five-eighth interest. H. L. Hunt selected 26,900-acre geophysical option Louisiana Delta Hardwood fee in townships 4 and 5 north, ranges 4 and 5 east, LaSalle Parish, and plans five Wilcox tests.

Carter Oil Co.'s Louisiana Delta D-1, NE NW 25-6n-3e, wildcat south side Catahoula Lake, LaSalle Parish, showed oil in sidewall cores 4294-4304 ft and 4310-11 ft; arranging set casing. Location between new Cypress Bayou field and Phillips Petroleum Co.'s (formerly M. H. Marr's) Eota Realty Co. 1, SW NE 14-4n-3e, now being standardized for production in Wilcox.

Mississippi

Lawrence County Showing Encourages Drilling Another

A second test is planned on structure indicated by 10,000-ft wildcat failure in Lawrence County; Tide Water Associated Oil Co.'s Denkman 1, NE SW 5-5n-11e, was abandoned at 10,808 ft but it proved existence of structure as it ran 500 ft regionally high on Wilcox and 750 ft high on Tuscaloosa (Woodbine). As originally mapped this area has three distinct structures imposed on major uplift. Second test planned immediately south of abandoned hole and will be in Section 29-5n-11e.

M. T. WORKS of Cameron Iron Works, Houston, discussed "Dual Completions" at the East Texas Section meeting of the American Institute of Mining and Metallurgical Engineers, December 16, at Kilgore.

We'll Not Forget

PEARL HARBOR

WE'VE SUPPLIED OIL MEN IN OUR AREA FOR 33 YEARS

PELICAN WELL TOOL & SUPPLY CO.

SHREVEPORT
LOUISIANA

PELCO

Houston
Berwick
Houma
New Iberia

California

Amerada Makes Second Strike in Fresno County

New Riverdale area discovery in Fresno County; outlook improves for Midway deep test in Kern County, while McDonald Anticline test abandoned; San Benito County test fails.

Fresno County: Second discovery in two months has been made by Amerada Petroleum Corp. in Fresno County with completion of Lawton No. 45-26 wildcat; Sec. 26-17-19, Riverdale area, flowing 558 bbls daily, 34-gravity oil cutting 4 percent drilling fluid through ¼-in bean together with 1,375,000 ft wet gas. Bottomed at 8311 ft, plugged to 8063 ft, production is through perforated interval 6665-6685 ft from Temblor zone topped at 5615 ft. Previous test on lower intervals were unfavorable. Top of McLure placed at 5345 ft, Kreyenhagen 7610 ft, Eocene 7900 ft. Two months ago company discovered Helm - Cloverdale field in Sec. 34-16-17, also a Temblor zone area, with Clover 31-34 wildcat.

Kern County: Outlook for successful completion of North American Oil Consolidated's W. P. No. 1-28 deep test at Midway-Sunset has again improved with obtaining 38-gravity oil for brief period during swabbing operations. Plugged bottom is at 9343 ft with tubing hung at 8953 ft. Operator of opinion flow was stopped by sand bridge and has shut in to allow pressure to build.

Texas Co. has abandoned Anderson 1 wildcat, Sec. 19-28-20, McDonald Anticline area after formation test failed to show commercial production; bottomed at 6777 ft.

San Benito County: Texas Co.'s Carter 1 wildcat, Sec. 3-17-21, Ciervo Anticline area, has been abandoned at 3265 ft after failing to pick up showings of importance in Eocene or Cretaceous.

Nebraska

Barada and Falls City Wells Being Tested

Sixth Barada pool producer testing; two Falls City wells ready to test; duster chalked up in Gage County.

Richardson County: Skelly Oil Co.'s Roesch 4, C W½ NE SW 36-3n-16e, topped Hunton lime 2374 ft, set 7-in and was ready to test; operator's Roesch 5, C W½ NW NW Sec 36, drilling 2000 ft; operator's Zimmerman 1, C W½ SE SW Sec 36, south of newest producer, completing cellar and pits. Ohio Oil Co.'s Bucholz 9, NW SE SW 17-1n-16e, Falls City pool, ran squeeze job in Hunton lime topped at 2228 ft, and was waiting to test; operator's Bucholz 10, NWc SW Sec 17, drilling cement plug, hole bottomed 2360 ft in Hunton lime.

Gage County: Walt Rider's Warren 1, C NE NE 21-3n-5e, 9 mi southwest of Beatrice, drilled to 2858 ft in granite, plugged back and perforated 1990-96 ft, 2000-05 ft, and 2310-12 ft, had water in all zones. Turner et al's Taylor 1, NEc SW 15-3n-6e, was waiting on cement with 15-in set at 110 ft. Nelson Drilling Co.'s Edius 1, C E½ SW 5-3n-7e, shut down at 1015 ft.

Rocky Mountain Area

Several Wildcats At Critical Depths

Wildcatting highlights Rocky Mountain activity as several tests are at critical depths while a number of wildcats are starting in widely separated areas.

Eastern Colorado: O. E. Torrey's Whitson 1, NW NW SE 12-13s-49w, Kit Carson area, Cheyenne County, had encouraging shows gas 3655 ft and 3820-26 ft, and drilling ahead below 4000 ft. While running low on Dakota sand, wildcat reversing self and checking 50 ft higher on Permian topped 2830 ft than Gulf's failure 3 miles southwest.

Stanolind Oil & Gas Co.'s Snell 1, C SE SW 7-20s-41w, drilling below 5100 ft and nearing Cherokee lime objective expected 5200 ft. Wildcat, South Towner block, Kiowa County, checking almost identically on lower beds in elevation with Stanolind's Patterson pool, Kearny County, Kans., opener, 30 miles due east.

Because of encouraging showings of oil and gas in Dakota series, despite abandoning of State 1, C SW SW 32-7n-51w, Stering district, Logan County, td 4840 ft in Dakota formation, Mutual Oil Co. plans seismograph survey of area prior to drilling second wildcat.

Shawnee Area: Harry Free et al's Jeffryes 1, SW SW SW 26-32n-69w, proved for nominal oil and gas production at 700-800 ft at White River-Cretaceous contact, Converse County, Wyo., topped Pierre shale going out of Tertiary overburden 927 ft. Semi-wildcat topped bentonite marker bed 1700 ft placing Shannon objective 2200 ft, drilling ahead below 2000 ft with slim hole.

Barker Dome: Southern Union Prod. Co. spudding Tribal 1, NE NW 21-32n-14w, Barker Dome, San Juan County, N. M., following leasing of Indian land covering structure. Test mile south of 30,000,000 cu ft gas well drilled by Gulf in 1929, but abandoned because of lack of market.

Michigan

Four Outposts Show Interesting Possibilities

Four outposts are showing as possible field openers and a fifth wildcat completed as a shallow gas field discovery. Sun Oil Co.'s Bauman 1, Section 29-24n-1w, Roscommon County, flowed 110, 95, 70 and 71 bbls respectively on successive days on 6-hour production tests, 2½ in tubing; 500-gallon acid Monroe lime at 4188-4203 ft. Probably will be retreated. Sun, Ohio and Pure control bulk of territory in area of well.

H. J. Hirzel's Oxendale 1, SE NE SE 36-18n-5w, Clare County, cased with 5-in at 3940 ft averaged 255 bbls daily first five days. Previously it had produced average 191 bbls day. It may be deepened. Production from Dundee at 3933 and pay at 3938-41 ft.

Taggart Brothers Co.'s Wirth 1, C S NE SE 22-18n-8w, Osceola County, gauged 490,000 ft gas day from Michigan Stray at 1423 ft to complete for new shallow discovery.

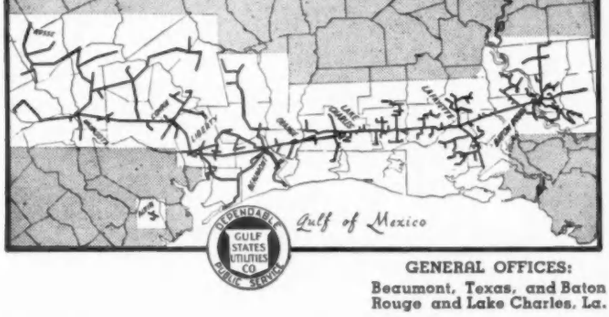
Frank Summer's Ellis 1, NE SW SE 14-4n-8e, Oakland County, logged oil saturation 4640 ft in top Niagaran limestone and will test.

John B. Spitzley's Simon 1, NW NE SE 21-7n-4w, Clinton County, pumped and swabbed 30 bbls oil, 2 percent water, first production test on Traverse 2484 ft.

Shell Buys Petroleum Producers Company

Petroleum Producers Company, Wichita Falls, became a fully-owned subsidiary of Shell Oil Company December 16 when the latter paid in excess of $2,250,000 cash for the 4500 outstanding shares, according to John F. O'Donohoe, president. The deal involves 380 oil wells on 60 leases, with average daily output of 2600 barrels. The bulk of the properties are in North and West Central Texas, and scattered interests in Southwest Texas and Lea County, N. M. R. B. Roark, vice president of Shell Oil Company, was elected president of Petroleum Producers Company. George W. Cunningham and J. M. Flaherty, all of Tulsa, were chosen vice president and treasurer, respectively. Fred W. Sehman was retained as secretary. The Wichita Falls concern was formed as a partnership in 1921, and incorporated in 1927 with par value of stock set at $100 per share.

Season's Greetings



GENERAL OFFICES:
Beaumont, Texas, and Baton Rouge and Lake Charles, La.

DONE IN OIL

By
DAVID D. LEVEN

The First Authentic Petroleum Encyclopedia

Chapter Headings: Petroleum Economics; Capital Investments and Expenditures; Supply and Demand; Major Oil Field Operations by States; Maintaining Oil Reserves; Oil Conservation and Proration; The International Oil Situation; Mexico's Oil Expropriations; The Importance of Oil in War; Petroleum Industrial Organization; Petroleum Sciences; Petroleum Prospecting; Drilling Operations; Casing the Well; Bringing in the Well; Protecting the Well; Producing the Oil; Secondary Methods of Production; Costs and Valuations; Petroleum Storage; Transportation; Refining; Natural Gas; Natural Gasoline; Crude Oil Marketing; Marketing Refined Products; Capital Investments; Investments and Appraisals; Oil Company Reports; Valuation of Wasting Assets and Problems of Depletion; Corporation Finances Involved in the Petroleum Industry; Principles of Investments and the Working of the Security Markets; Diversified Royalty Investments; The Oil Royalty Business; The Purchase and Sale of Royalties; Principles of Royalty Ownership; Royalty Information and Procedures; Oil Leases; Appraising and Valuing Royalties; Investment and Royalty Trusts; The Oil Situation vs. Royalty Investments; Conservation vs. Royalties; Investments Regulated; Regulation of Oil Royalties; Taxing the Petroleum Industry.

26 Photographs 22 Maps 29 Graphic Illustrations 108 Tables
1084 Pages Fabrikoid Binding Price $10.00

Send Orders to the

GULF PUBLISHING COMPANY
P. O. BOX 2608, HOUSTON, TEXAS

UNITED STATES WELL COMPLETIONS

Company, Well and Location	Init. Prod. Bbls.	Depth
Arkansas		
Union County (East Schuler)—		
Placid Oil Co., J. M. Bishop 1, 14-18-17	175	5892
California		
Fresno County (Coalinga)—		
Shell, No. 8-29	294	2800
Fresno County (East Coalinga Eocene)—		
Standard, No. 33-31B	2164	8200
Kern County (Belridge)—		
Belridge Oil Co., No. 24-27	110	8500
Kern County (Coles Levee)—		
Standard, KCL 20-1-G-9	¶13.4	5290
Union, Kernco 2-12	391	9907
Kern County (Elk Hills)—		
Standard, Tupman 237	57	3000
Kern County (Greeley)—		
Standard, KCL 12-16	2740	11510
Kern County (Midway Maricopa)—		
H. & T. Oil Co., No. 3	80	1258
Kern County (Mount Poso)—		
Shell, Griffith Fee 1	719	1825
Shell, Security 37	68	2019
Kern County (Shale Hills area)—		
Texas, Anderson Inc., 1	*	5777
Kern County (Ten Sections)—		
Shell, KCL A-55-30	No Est.	8210
Los Angeles County (Inglewood)—		
Hogan Petroleum Co., Machado 4A	1800	8350
Los Angeles County (Long Beach)—		
Shell, Hamilton 3	23	7086
Los Angeles County (Puente Hills)—		
Sunset Oil Co., Baldwin 1	*	4681
Los Angeles County (Wilmington)—		
Lee S. Davis, No. 2	200	3710
Los Angeles Basin Pet. Co., Phillips 3	125	3743
Royalty Service Corp., Packard 20-8-2	126	3505
Union Pacific, UPE-38	847	3520
San Benito County (Ciervo Area)—		
Texas, Carter 1	*	3265
Santa Barbara County (Santa Maria Valley)—		
Southwestern Development Co., Mendoza 1	*	1683
Union, Stinson 7	364	5355
Ventura County (Ventura Avenue)—		
Tide Water, Lloyd 84	924	7325
Colorado		
Logan County (Sterling)—		
Mutual Oil Co., State 1, c sw sw 32-7n-51w	*	4840
Moffat County (Iles)—		
Stanolind, Parkinson 11-X, c ne se 22-4n-92w	1584	3358
Illinois		
Clay County—		
Gulf, Tolliver 2, sw se ne 26-4n-7e	23	2338
B. F. Williams, Schwartz 1, c nw ne sw 35-4n-7e	*	2616
W. C. McBride, McCrane 1, ne nw se 34-4n-7e	60	2602
Coles County—		
B. F. Williams, Alexander 1, c w½ ne ne 16-11n-7e	*	2355
Edwards County—		
Joe Bander et al, Wells 1, c e½ sw ne 31-2n-14w	2052	3150
Effingham County—		
Albert Day, Hogue 1, nw nw sw 34-9n-4e	*	1645
Fayette County—		
Wm. H. Brown, Radliff 1, c w½ nw ne 24-7n-1e	*	2033
Carter Oil Co., Wright 16-D, c ne se 20-8n-3e	*	3122
Dial 3-D, c se ne 28-8n-3e	250	3105
McCloy 5-D, c e½ ne ne 32-8n-8e	250	3093
Franklin County—		
H. H. Wegener, Kennedy 1, se ne sw 36-5s-2e	*	2824
Smokey Oil Co., Sisk 1, sw nw ne 1-6s-2e	212	2700
Winn 1, ne ne se 11-6s-2e	*	2900
Luttrell et al, nw sw nw 12-6s-2e	*	2903
Bell & Zellers Coal Co., Zigler Coal & Coke 1, ne ne nw 19-7s-2e	*	2823
Gallatin County—		
Oil Management, Inc., Egyptian T&T 9, sw se se 16-8s-10e	125	2425
Hamilton County—		
Cherry & Kidd, Gardner 2, ne se ne 24-3s-7e	150	3254
Lion Oil, Mitchell 1, e½ se sw 29-4s-6e	*	3525
Kingwood, Johnson 1, s½ se ne 3-5s-6e	*	594
Shell, Smith 1, nw ne ne 13-6s-5e	346	3288
Lockwood "B" 2, se ne sw 13-6s-5e	794	3348
Schoenfelt-Hunter et al, Hamilton 3, nw nw se 13-6s-5e	520	3185
Texas Co., Lockwood 6, sw se sw 13-6s-5e	1205	3351
McDonald 5, nw sw ne 11-6s-6e	112	3061
Edwards 6, se ne nw 11-6s-6e	14	3270
Shavitz 1, e½ sw ne 27-6s-6e	420	3098
Tuesday Oil Co., Phillips 3, e½ nw sw 26-6s-6e	*	3110
Oil Management, Lockwood 2, se nw nw 23-6s-5e	79	3139
Gulf, Morlon 3, nw nw se 14-6s-5e	540	3200
Morlon 4, sw nw se 14-6s-5e	650	3200
Jackson County—		
Glenwood Oil Co., Truex-Traer Coal 1, e½ se sw 36-7s-2w	*	2015
Jasper County—		
Pure, Hall 4, w½ nw sw 17-5n-10e	47	2840
Miles 1, e½ sw ne 18-5n-10e	471	2865
May 3, se sw ne 8-6n-10e	84	2825
Texas, Benskin 2, sw nw se 5-6n-10e	280	2802
Jefferson County—		
First Nat'l Pet. Trust, Hall 3, sw se nw 36-2s-1e	150	1991
Magnolia, Kamiski Est. 3, se ne se 2-3s-1e	219	1957
Kingwood, Interstate Coal 1, n½ ne nw 4-4s-2e	*	2870
Macoupin County—		
Fred Mudjett, Goebelt 3, ne se sw 20-10n-7w	25	462
Goebelt 2, sw ne sw 20-10n-7w	11	443
Goebelt 1, w½ ne se 20-10n-7w	10	447
Richland County—		
Pure, Miller 1, w½ se ne 2-3n-9e	*	3000
Grubb "A" 1, e½ se ne 18-3n-9e	*	3025
Ed Nolf et al, Sterchi Heirs 1, sw nw nw 6-4n-14w	782	3033
St. Clair County—		
Ed Gieck, Goodman 1, ne ne se 5-3s-7w	*	490
Tarleton Oil Co., Reichart 4, nw nw nw 34-1n-10w	130	749
Wabash County—		
Lubernicht, Andrus 1, nw nw se 20-1s-12w	4	2035
Zephyr Drlg. Co., Spencer 2, se se sw 17-2s-13w	298	2774
W. W. Gray, Fee "A" 22, se ne sw 14-3s-14w	115	2540
Joe Young, Sparks 3-A, sw ne se 36-2n-12w	*	1490
Wayne County—		
Ivan White, Kieffer 1, w½ nw se 2-1s-6e	*	3274
Olson Drlg. Co., Oglesby-Hopkins 4, ne ne nw 3-1s-6e	480	3038
Oglesby-Hopkins 3, nw ne nw 3-1s-6e	500	3038
Porter 2, w½ nw se 36-1n-6e	22	3110
States 2, e½ ne sw 36-1n-6e	23	3086

*Failures; †Junked; ¶Million cu. ft. gas.

Summary of Drilling Operations in the United States, Week Ended December 20, 1941

	WELLS COMPLETED								[1]PERMITS FOR NEW WELLS				
	Total for Week	New Wells Drilled for Oil and Gas: Oil Wells	Gas Wells	Failures	[3]Miscellaneous	Initial Production	Total 1941	Total this Date 1940	This Week	Total this Month	Total 1941	Total this Date 1940	Year Total 1940
Alabama	....	....	....	....	....	....	5	9	....	....	....	....	....
Arkansas	1	1	....	....	....	175	185	179	3	7	180	150	153
California	23	18	1	4	....	11,032	1,172	1,077	15	60	1,154	1,080	1,042
Colorado	2	1	....	1	....	1,584	21	10	....	....	....	....	....
Florida	....	....	....	....	....	....	1	2	....	....	....	....	....
Georgia	....	....	....	....	....	....	1	....	....	....	....	....	....
Illinois	82	59	....	22	1	17,884	3,897	3,912	94	278	4,665	4,454	4,532
Indiana	15	7	2	3	3	1,388	533	517	14	51	[2]327	....	....
Iowa	....	....	....	....	....	....	6	1	....	....	....	....	....
Kansas	32	23	1	6	2	25,354	2,174	1,961	56	150	2,314	2,021	2,048
Kentucky	6	3	1	2	....	231	330	365	11	30	[2]217	....	....
Louisiana	34	16	2	16	....	2,973	1,541	1,685	32	103	1,718	1,646	1,658
Michigan	31	15	6	9	1	30,100	864	1,180	12	91	987	1,077	1,093
Mississippi	1	....	....	1	....	....	198	184	....	....	....	....	....
[1]Missouri	....	....	....	....	....	....	65	31	....	....	9	26	26
Montana	18	5	7	6	....	560	244	191	....	....	....	....	....
[1]Nebraska	1	....	....	1	....	....	91	47	....	....	95	68	69
New Mexico	8	5	....	3	....	1,039	395	614	9	21	399	555	559
New York	33	18	....	....	15	121	1,087	948	....	....	....	....	....
Ohio	35	10	14	10	1	197	1,749	1,103	....	....	....	....	....
Oklahoma	45	27	2	11	5	20,903	2,110	2,113	41	125	2,289	1,867	1,888
Pennsylvania	9	....	5	1	3	....	3,598	3,236	....	....	....	....	....
South Dakota	....	....	....	....	....	....	....	1	....	....	....	....	....
Tennessee	....	....	....	....	....	....	16	12	....	....	....	....	....
Texas	192	133	7	47	5	66,890	10,247	9,657	274	662	11,910	10,947	11,170
Utah	....	....	....	....	....	....	3	3	....	....	....	....	....
West Virginia	29	7	16	3	3	47	757	635	....	....	163	770	782
Wyoming	3	3	....	....	....	382	134	153	....	....	....	1	1
Total this week	600	351	64	146	39	180,860	31,424	29,826	561	1,578	26,427	24,662	25,021
Total last week	682	437	62	134	49	182,757	30,824	29,279	444	1,017	25,866	24,218	25,021
Total this year	31,424	19,200	2,511	6,848	2,865	8,653,251	.....	.....	....	.....	.....	.....	.....

[1] This tabulation includes those states where weekly data are available; figures for Missouri date from August 10, 1940; Nebraska from August 3, 1940.
[2] No data available before June 14, 1941.
[3] Includes old wells deepened, water-intake, gas input, and salt water disposal wells.

United States Well Completions—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
B. H. Nation, Hanison 1, w½ sw nw 19-2s-8e	*	3497
Shell, Williams 2, n½ sw sw 22-1n-6e	1645	3235
Cisne State Bk. "A" 2-A, ne sw se 22-1n-6e	238	3228
Wiser Oil Co., Hillard 2, n½ se sw 23-1n-6e	189	3192
Illinois Prod. Co., n½ sw ne 26-1n-6e	175	3187
Texas Co., Case 1, n½ se nw 28-1n-6e	320	3235
E. J. Ruwaldt, Knapp 1, s½ ne se 35-1n-6e	490	3210
Pure, Orr 1, w½ sw sw 12-1n-7e	75	3127
White County—		
P. E. Tipton, Jolly Est. 1, sw ne sw 21-3s-14w	*	3167
Wabash O&G Assn, Reeves Hrs. 6, sw nw se 28-3s-14w	74	2579
Pure, Fox "A" 1, nw sw nw 19-3s-8e	204	3261
Hudson-Hess, Poorman 8, nw nw ne 30-3s-8e	500	3230
Poorman 7, sw nw ne 30-3s-8e	265	3226
Poorman 6, nw sw ne 30-3s-8e	682	3230
New Penn Development, Williams 2, w½ e½ nw 28-3s-9e	46	3399
Haynes & Yingling et al, Hon "G" 2, nw sw ne 9-4s-14w	41	2733
Superior, Ford 6, c nw nw sw 23-4s-14w	125	2661
Greathouse "A" 3, nw ne sw 34-4s-14w	650	2845
Ford 18, sw nw sw 4-5s-14w	234	2945
McKee H. Marshall, Bramlet 1, sw nw ne 15-6s-9e	38	2832
A. H. Anderson et al, Leathers 1, sw c sw se ne 22-6s-9e	9	2634
Cherry, Kidd et al, Ackerman 1, ne nw nw 24-6s-10e	122	2950
Fisher-Arrow Drlg., Ellis 9, sw se sw 11-7s-8e	272	2916
Kingwood-Sinclair, Unit 1, sw ne sw 12-7s-8e	17	2917
Stroube Bros., Hamilton 1, ne se sw 13-7s-8e	*	2925
Sinclair-Wyoming, Brackett 3, nw nw nw 13-7s-8e	20	2907
OLD WELLS DEEPENED		
Franklin County—		
H. H. Wegener, Kennedy 1, se ne sw 36-5s-2e (otd 2849)	*	2824

Indiana

Company, Well and Location	Init. Prod. Bbls.	Depth
Gibson County—		
R. D. Brown, Inc., Antell 1, c ne se 20-1s-11w	250	2262
Continental Oil Co., Bozeman Land Co. 53, c ne nw nw 26-3s-14w	35	2779
Jay County—		
E. G. Henderson, Ickes 1, ne ne se 35-23n-15e	¶0.5	1134
Pike County—		
Irwin & Powderly, McAtee 3, 12-1n-9w	*	1670
Posey County—		
Indiana Farm Bureau, Seifert 1, ne sw nw 30-6s-12w	35	1099
Lindas & Riddle, Seifert 1, nw ne nw 30-6s-12w	55	1098
S. D. Jarvin, Gumbel 1, se sw se 36-6s-12w	114	1794
Carter et al, Maier C-76 1, c n½ ne sw 1-7s-14w	766	2887
Spencer County—		
E. J. Goldschmidt, Swallow 1, sw se se 32-6s-7w	20	996
S. D. Jarvis, Swallow 2 (3), se sw se 32-6s-7w	*	1040
Wayne County—		
E. L. Root, Kain 1, nw nw ne 26-17n-12e	¶70	885
White County—		
Ohio Oil Company, Horton Heirs 1, ne ne ne 1-28n-5w	*	1638
OLD WELLS DEEPENED		
Elkhart County—		
M. C. Pletcher, Clifford 1, ne se se 13-38n-4e (otd 1929)	*	2021
Gibson County—		
Hall Edwards, Rec'r, Edwards 15-A, se nw nw 13-3s-14w (otd 2545)	57	2549
Edwards 9-C, sw se se 14-3s-14w (otd 2092)	56	2865

Kansas

Company, Well and Location	Init. Prod. Bbls.	Depth
Barton County—		
Shell, Ehrlich "A" 8, 8 ft w of c n½ n½ nw 18-16s-13w	1230	3366
Luerman 4, sw ne sw 18-16s-13w (pb 3282)	123	3351
Bitter "B" 1W, sw se nw sw 5-16s-13w	Salt Wtr. Dspl.	3602
E. Jonas et al, Rick "B" 1, sw nw sw 1-19s-11w	*	3387
Kiowa Drlg., Christiansen 1, c e½ ne sw 17-20s-12w	*	3505
Central Pet. et al, Brewer 1, c w½ sw ne 23-20s-15w	*	3719
Ellis County—		
Cities Service, Collahan "C" 7, c e½ ne se 24-11s-17w	3000	3360
Deep Rock, Baumer 34, c e½ nw se 27-11s-17w	1675	3586
Ellsworth County—		
Shell, Stevenson 2, ne se sw sw 35-16s-10w	248	3299
Greenwood County—		
Katz et al, Life "B" 1, c ne sw 13-26s-9e	35	2121
Harvey County—		
McBride et al, Stucky 1, c n½ ne sw 6-22s-1w	*	3361
Jefferson County—		
Mossbacker et al, Doleman 1, nw nw se 27-9s-20e (pb 1460)	¶.75	1615
Leavenworth County—		
Longwell, Bankers Life 3, ne ne sw 3-10s-20e	77	1461
Marion County—		
Harwood, Novak 12, c w½ e½ sw 28-17s-4e	231	2424
McPherson County—		
H. & M. Drlg., Anderson 1, c e½ se nw 21-17s-1w	433	2670
Continental, Huxman 11, c w½ w½ nw 29-21s-1w (pb 3300)	481	3321
Pawnee County—		
Stanolind-Amerada, Deckert 1, c w½ nw ne 24-20s-16w	383	3848
Phillips County—		
Cities Service, Ray "A" 4, ne se se 32-5s-20w	2245	3600
Pratt County—		
Skelly, East Maxedon 8, c s½ s½ ne 25-27s-11w	236	3464
Gulf, McClellan "B" 1, c n½ nw sw 36-27s-11w (pb 3510)	102	3541
Reno County—		
Magnolia, Yust 1, sw sw sw 15-23s-10w	3000	3788
Cities Service, Snowberger 2, sw nw nw 22-23s-10w	3000	3801
Rice County—		
Transwestern et al, Roesler 6, c w½ sw nw 6-18s-10w	812	3245
Holl & Branine, Warner "C" 1, c s½ se ne 16-20s-10w	4297	3124
Colorado Pet., Thompson 1, c s½ se sw 17-20s-10w	3000	3150
Mid-Plains, Nelson 3, c s½ nw sw 12-21s-7w	40	3403
Rooks County—		
Cities Service, Catudal 1, se sw sw 14-10s-19w	*	3706
Russell County—		
Cities Service, Ebel "B" 6, c s½ ne se 24-14s-14w	314	2932
Leader Oil, Rude 3, c w½ sw se 28-15s-14w	*	3370
Texas Co., Boxberger "A" 3, c w½ ne se 22-14s-14w (pb 3057)	128	3068
Stafford County—		
F. C. Hall, O'Conner 2, c e½ ne nw 14-24s-12w (pb 3865)	264	3886
OLD WELL DEEPENED		
Sedgwick County—		
Continental & Gulf, Shawver 9, sw ne nw 7-26s-1e (otd 3372) St. Wtr. Dsp.		4107

Kentucky

Company, Well and Location	Init. Prod. Bbls.	Depth
Breckenridge County—		
W. J. Flescher et al, 23-Q-35	*	467
Davies County—		
Anderson et al, Kindall 1, 10-Q-30	*	844
Hancock County—		
Leeper Oil Co., Rowland 8, 3-O-33	¶.3	736
Ohio County—		
John Tuttle, Miles 3, 19-N-34	20	267
Union County—		
Sun, McKenney 1, 20-O-18	75	1350
Reyburn 2, 20-O-18	136	1352

North Louisiana

Company, Well and Location	Init. Prod. Bbls.	Depth
Caddo Parish (Vivian-Pine Island)—		
Burnham Drlg. Co., Thigpen-Herold A-1, 34-22n-16w	*	2520
Caddo Parish (Pine Island)—		
L. W. Rinaman, Muslow 1, 32-21n-15w	35	1575
Magnolia, Doan-Thigpen 40, 6-20n-15w	40	1540
Caddo Parish (Shreveport)—		
R. E. Allison et al, Ellerbee 11, 27-18n-14w	*	8690
Caldwell Parish (Wildcat)—		
Mudge Oil Co., Southern Kraft 1, 5-11n-4e	*	3515
Catahoula Parish (Wildcats)—		
C. H. Lyons et al, Hargis 1, 18-7n-6e	*	6345
Placid Oil Co., Grant Timber Co. 1, 21-7n-6e	*	6590
Phillips, Tensas-Delta B-3, 14-5n-5e	*	6010
Concordia Parish (Wildcat)—		
H. W. Elliott et al, Brown 1, 33-8n-8e	*	6587
DeSoto Parish (Logansport)—		
Southern Prod. Co., Slaid 1, 5-11n-15w	¶25	5510
LaSalle Parish (Wildcat)—		
N. H. Wheless et al, Louisiana Delta B-1, 3-5n-3e	*	6000
LaSalle Parish (Little Creek)—		
H. L. Hunt, Goodpine F-49, 30-9n-2e	¶30	2712
Placid, Goodpine B-9, 27-9n-2e	85	2725
LaSalle Parish (Nebo)—		
H. L. Hunt, Goodpine F-16,11-8n-2e	*	4540
Goodpine A-37, 15-7n-3e	150	4084
Placid, Goodpine F-17, 2-8n-3e	*	5052
Federal Land Bank 2, 40-7n-3e	150	4058
Graham & Harter, Walker 1, 38-7n-3e	*	4100
W. O. Woodard, Coon 2, 11-7n-3e	100	4022
Coon 3, 11-7n-3e	150	4080
LaSalle Parish (Olla)—		
Placid, Louisiana Central 119, 8-10n-3e	*	2425
LaSalle Parish (Urania)—		
Haynes & Alexander, Urania 3, 2-9n-1e	*	1510

South Louisiana

Company, Well and Location	Init. Prod. Bbls.	Depth
Allen Parish (Wildcat)—		
J. A. Hafner, Jr., Pierre Nevils 1	*	8014
Acadia Parish (North Crowley)—		
Humble, Reiners 9	16	8833
Calcasieu Parish (Edgerly)—		
Gulf & Louisiana Progress, Miller 2	*	9184
East Baton Rouge Parish (Wildcat)—		
Texas Progress, Nelson 1	*	10310
Evangeline Parish (Ville Platte)—		
Continental, Fontenot-Tate 3, Unit 28	119	10208
Evangeline Parish (Pine Prairie)—		
Gulf, Easton Townsite 1	281	8175
LaFourche Parish (Golden Meadow)—		
Texas Co., Falgout Holding Co. 19	227	5640
LaFourche Parish (Lake Long)—		
Fohs Oil, Octave Aucoin 1	416	10258
LaFourche Parish (Raceland)—		
Amerada & L.L.E., South Coast Corp. 9	225	10260
Plaquemines Parish (Garden Island)—		
Texas Co., State 54-214	235	6792
Plaquemines Parish (Grand Bay)—		
Texas Co., State-Demis 2-335	357	10050
St. Charles Parish (Paradis)—		
Texas Co., LLE-Paradis 16	387	10457

Michigan

Company, Well and Location	Init. Prod. Bbls.	Depth
Allegan County—		
Chris Schrauben, Wilson 1, nw sw sw 21-1n-13w	30	1371
Muskegon Dev. Co., Puschel 1, nw nw se 18-3n-12w	225	1527
Perry & Gould, Schafer 3, sw ne sw 18-3n-12w	125	1619
Thomas Fenson, Smith 1, w½ e½ w½ se 10-4n-13w	50	1604
Bay County—		
L. C. MacGregor, Staudacher 2, sw sw nw 2-14n-4e	50	2875
Cass County—		
A. C. Murray, Berkey 1, sw nw se 19-5s-14w	*	1080
Clare County—		
Taggart Bros. Co., Acker 96, c se 19-20n-6w	¶17	1399
Richardson 35, c sw 21-20n-6w	¶1	1390
Genesee County—		
H. H. Heinig, Davidson 1, nw nw nw 8-9n-8e	*	1920
Gladwin County—		
Sun, Holycross 1, c w½ se se 26-17n-2w	20	3906
Stork Oil Co., Smart 5, sw ne nw 29-17n-2e	30	3535
McClanahan & Bagwell, State 1, c n½ nw sw 14-19n-2e	*	3233
Lake County—		
Rose & Swanson, Pfuhl 2, c s½ ne se 25-18n-11w	1400	3639
Mason County—		
Merrill & Dean, Renn 1, sw ne se 21-17n-15w	*	1998
Mecosta County—		
American Prod Co., Trust 1, se nw sw 24-16n-9w	*	1489
Osceola County—		
Taggart Bros. Co., State 27, c se 17-18n-10w	¶13	1178
Kalb 29, c e½ 18-18n-10w	¶11	1264
Richards 30, c nw 19-18n-10w	¶9½	1290
Wirth 1, c s½ ne se 22-18n-8w	¶½	1423
Pure, Brock 3, c n½ sw sw 20-18n-10w	12,050	3630
Mitchell 2, c s½ ne nw 30-18n-10w	40	3616
Campbell 2, c s½ ne sw 19-18n-10w	1100	3612
Ohio, Heilman 2, c n½ sw se 19-18n-10w	5500	3606
Riggs 1, c n½ se ne 19-18n-10w	2500	3590
Johnson A2, c n½ sw sw 29-18n-10w	5880	3546
Ottawa County—		
Borough, Inc., Halzey 1, ne se sw 21-7n-13w	*	2011
Roscommon County—		
Freeman Oil Co., State A3, c s½ nw sw 34-21n-3w	1100	3362
Van Buren County—		
Circle Drilling Co., Adkins 1, sw ne nw 23-1s-14w	*	1660
J. A. Conant, Gatto 1, se nw sw 2-1s-15w	*	1437
Sun, Buys 1, se se se 5-3s-14w	*	1315
OLD WELL DRILLED DEEPER		
Bay County—Major and Roush's McDonald 1, sw se sw 2-18n-3e, old td 2950 ft; so 4150 ft, td 4330 ft, abnd.		

United States Well Completions—*Continued*

Mississippi

Lawrence County (Wildcat)—
Tide Water Associated, Denkman 1, 5-5n-11e ..... • 10808

Montana

Blaine County (Bowes)—
Independent Nat. Gas Co., Miller 1011, se se se 8-31n-19e ..... ¶4 1147
Fallon County (Cedar Creek)—
W. H. McDonald, Govt. 2, c sw nw 5-5n-60e ..... • 2000
Glacier County (Cut Bank)—
Cobb & Jeffries, Texas-Fee 1, sw nw sw 19-32n-5w 50 3010
Indian Oil Co., Fee 2, c nw sw 4-34n-6w ..... • 3067
McDonald & Henderson, Overcash 3, se ne nw 29-32n-5w 100 2778
Santa Rita Oil & Gas Co., Rasmussen 7, cel nw sw 33-33n-5w..... • 2998
State 1, sw ne se 25-33n-6w.... • 2956
Wilkinson & Potter, Inc., Tribal 3-126, cn nw 7-32n-5w..... 150 2882
Hill County (Box Elder)—
Montana Gas Corp., Fee 2, ne ne nw 24-32n-17e ..... • 1305
Phillips County (Bowdoin)—
Montana Dakota Utilities Co., Kippen 634, c sw sw 20-32n-34e.... ¶½ 870
Robinson 644-A, c nw sw 15-32n-33e ..... • 2178
Kippen 646, c nw ne 25-32n-33e.. ¶¼ 1028
Sudbrock 650, c sw se 24-32n-33e ¶½ 1008
Shaw 651, c sw sw 31-32n-34e.. ¶¼ 795
Sudbrock 655, c ne se 28-32n-34e ¶½ 870
Reilly 666, c nw ne 29-32n-34e.. ¶½ 1010
Toole County (Kevin)—
Hi-Gravity Oil Co., Govt. 3, se ne sw 18-35n-3w 240 2495
Prevol & Shay, Waite 10, nw sw nw 24-35n-2w 20 1523

New Mexico

Eddy County (Wildcat)—
Trojan Oil Co., Grant 1, swc ne 33-20s-25e ..... • 2600
Eddy County—
O. F. Featherstone et al, Brooks 1-A, nw ne sw 25-17s-27e..... • 548
Paton Bros. et al, Russell 6-A, ne se sw 35-17s-27e..... 50 431
Premier Pet. Co., Beeson 1-B, nw ne ne 33-17s-30e..... 38 3507
Stroup & Yates, Travis 4, c n½ ne nw 17-18s-29e..... 150 2484
Lea County (Lynn)—
Western Gas Co., Combest 1, c se ne 35-22s-36e ..... † 1966
Lea County (Mattix)—
Skelly, Liberty Roy 1, c sw se 7-24s-37e 73 3595
Lea County (West Eunice)—
Wilson Oil Co., State-Amerada 2, c sw ne 13-21s-34e..... 728 3741

New York

Allegany County—
Ebenezer Oil Co., Herrick farm, Alma 9 1356
Messer Oil Co., Vosburg farm, Bolivar 7 1341
Trio Oil Co., Wetherby farm, Bolivar 9 1388
Pure Penn Pet. Corp., Christman farm, Bolivar 5 1422
Producers Oil Corp. "A," Keller-Scott farm, Wirt..... 9 1059
Brothers Oil Co., Crandall farm, Bolivar 5 1367
Messer Oil Co., Shaner farm, Bolivar 10 1470
Hog Brook Oil Co., Pike farm, Alma 9 1419
Summitt Oil Co., Doty farm, Scio. 5 1131
E. B. Sage et al, Vars farm, Bolivar 5 1431
Bradley Bros. Inc., Withey farm, Bolivar 5 1411
McEbenwood Oil Co., Pingery farm, Andover 8 1349
H. W. Patterson et al, Fuller farm, Amity 5 874
Ockerman farm, Amity 5 860
Otto Oil Co., Bartlett farm, Bolivar 5 1269
Sloan & Zook, Schram farm, Bolivar 7 1429
Willetts & Paul Corp., Willetts farm, Genesee 7 1555
Ella Oil Co., Crandall farm, Bolivar 6 1344

WATER INTAKE WELLS

Vosburg Oil Co., Green farm, Bolivar 1269
Messer Oil Co., Vosburg farm, Bolivar 1370
N. V. V. Franchot, Murphy farm, Bolivar 1423
South Bolivar Oil Co., McKelvey farm, Bolivar 1358
Boyd Oil Co., Drum farm, Wirt.... .. 1376
Wheel Oil Co., Norton farm, Scio.. .. 1370
Bradley Prod. Corp., Rolls farm, Alma 1347
The Otsquago Corp., Pike farm, Alma 1419
Albert Oil Co., Coats farm, Alma.. .. 1074
O. D. Underwood et al, McDivitt farm, Bolivar 1349
P. J. Shaughnessy et al, Daley farm, Willing..... .. 1339
Cousins Oil Co., Roeske farm, Wellsville 1353
H. W. Patterson et al, Browning farm, Scio 661
Bliven Hill Oil Co., Norton-McEwen farm, Amity..... .. 892
L. & D. Oil Co., Browning farm, Scio 565

Ohio

Ashland County—
Lyons et al, McClure 7..... • 2823
Konrad & Beu, Franks 2..... • 702
Ashtabula County—
Ohio Oil Co., Hatton 1..... • 3841
Athens County—
Snyder, Pennybacker 1..... • 1770
Coshocton County—
I. A. Stinson et al, Ashcraft 2..... • 3280
Cuyahoga County—
Hoey & Cummins, Darrow 2.....¶0.4 2729
Gallia County—
C. A. Cody, Barton 1.....¶0.15 1708
Harrison County—
Benedum-Trees, Chapman 1..... • 5614
Holmes County—
Ohio Fuel, Allison 1.....¶0.15 3052
Knox County—
H. E. Perkins, Lepley 1.....¶0.32 947
Licking County—
Allen Willey, Wince 1.....¶0.59 2605
Preston Oil Co., Corkwell & Spencer 1 ..... 5 874
Loraine County—
H. C. Bishop, Jarvis 1..... ¶1.2 2462
Medina County—
H. C. Bishop, White 1..... • 2586
East Ohio, Queen 1.....¶0.36 2752
Thornton Producing Corp., Ross F1 5 434
Ross F2 ..... 5 429
Ross F3 ..... 5 455
Ross F8 ..... 5 432
Meigs County—
Nolan Shuster, Nelson 5 ..... • 979
Monroe County—
Harold Spence, Fee 1..... ¼ 1500
Bartenschlog & Kovert, Bach 2..¶0.05 1744
T. A. Drum, West 2..... 3 2124
Morgan County—
Industrial Gas Corp., Eppley 2.... ¶0.4 4165
W. S. Harris, Woodyard 3..... • 984
Muskingum County—
Mehowa Oil & Gas Co., Floyd 3.... ¶3.0 4123
Noble County—
E. O. Burbacher et al, Davis 1... ¼ 265
H. G. Clymer, Guiter 2..... ¶0.1 1668
Perry County—
Preston Oil, Humphrey 1....12 & ¶0.01 3316
Palm Oil Corp., Inc., Forgraves 4 ..... 155 & ¶0.05 3320
Clyde Foraker, Thomas 1..... ¶2.7 3625
Tuscarawas County—
Natural Gas Co. of West Virginia, Lebold 1 .....¶0.17 4723
Washington County—
Campbell et al, Ormiston 1.....¶0.05 1512
Worthington & Tompkins, Folge 1 • 1242

INPUT WELLS

Medina County—
R. C. Holmes et al, Hostettler W20 ¶ 491

Oklahoma

Caddo County—
Texas Co., Mulkehay 1, sw nw se 2-5n-12w 14,388 3492
Magnolia, Caddo-Rowe 9, sw sw ne 36-6n-10w 56 3250
Carter County—
J. S. Batson, Moore 2, nw se ne 5-1s-3w 105 3324
Dillingham et al, Harrell 4, se ne sw ne 22-2s-2w 10½ 1225
Comanche County—
Texas Co., Gamble 1, sw ne se 5-3n-10w ..... • 6276
School Land "B" 1, c sw sw 13-4n-11w ..... • 5233
Creek County—
Balph Starr 2, ne se sw 7-15n-8e.. 55 3800
Hughes County—
Patco, Larney 1, ne sw sw 13-9n-10e 180 3987
Jackson County—
Gulf, Fowler 2, ne ne sw 9-1n-20w.. • 2723
Jefferson County—
O. B. Beck, Seay 12, sw nw sw se 34-6s-5w (pb 1345)..... 18 1618
Lincoln County—
Llano, Richie 1, nw ne ne 32-15n-5e 10 3543
Logan County—
Champlin, McDanler 1, c e½ se sw 16-18n-4w .....¶13.5 3438
Okfuskee County—
Chapman & McFarlind, Deathridge 1, se ne se 1-10n-8e 95 3004
Doke & Hughes, Guston 2A, ne nw ne se 16-10n-11e ..... • 1782
Malernee, Roberson 1B, nw ne se 7-11n-8e 642 3694
Shell, Van Pelt 7, 60 ft e of ne nw nw 35-11n-8e 341 3481
Snuary, Miracle 3, nw nw se 35-11n-8e 795 3426
Oklahoma County—
Phillips, Faulkner 1, sw se sw 27-12n-3w 373 6563
Okmulgee County—
M. P. Springer, Sullivan 1, sw c se sw 5-12n-12e .....¶2.5 3243
W. W. Wilson, Corbray 9B, nw c sw se 22-14n-14e ..... • 2385
Osage County—
Texas Co., Emma 1, nw ne nw 16-23n-7e 150 3004
Norbla & Peters Pet. 1, 200 ft e of se se ne 19-23n-10e 600 2504
Lewis Prod., 9, ne sw ne sw 27-24n-7e (pb 2625) 30 2711
Pawnee County—
H. Fogle, Truschel 1A, ne se ne 35-21n-7e ..... • 1915
Pottawatomie County—
Lake, Bullard 1, 230 ft w of se se nw 31-5n-5e 50 2673
E. W. Young, Brown "A" 1, ne sw ne 6-7n-4e 230 4005
Denver P&R, Decker 4, nw sw se 8-7n-4e ..... • 4233
Kosmos, Milburn 1, se ne nw 15-7n-4e 220 4281
Sinclair Prairie, Rice "B" 4, sw ne ne 17-7n-4e (pb 4070) 109 4160
Stanolind, Logan 1, ne ne ne 2-9n-3e (pb 5312) 196 5375
Sunray, Billington 2, sw se se 22-9n-4e (pb 4575) 385 4685
Simpson-Fell, Billington 4, c se se 24-9n-4e 130 4240
Sun, Kessinger 2, nw ne sw 25-9n-4e 163 4342
Seminole County—
Eason & Grisso, Bryant 2, se sw nw 7-6n-8e 60 1230
Sinclair Prairie, Davis B 4, nw ne sw 7-6n-8e ..... • 1210
Curd, Wood 1, sw ne sw 26-7n-6e (pb 3124) ..... • 3287
Amerada, Edwards 6, nw se ne 22-9n-5e 225 3467
Stanolind, Palmer 2, se sw nw 33-9n-8e (pb 3753) 10.5 4302
Stephens County—
Rockett Oil, Mitchell 2, 30 ft w of ne nw se 36-1s-5w..... • 776
Tulsa County—
T. E. Turner, Hagie 2A, se ne se ne 11-16n-12e ..... • 1467

OLD WELLS DEEPENED

Creek County—
Tibbins, Wilson 5, nw se nw se 18-14n-9e (otd 2406) ..... • 3264
Logan County—
Sinclair Prairie, Kendricks 1, sw nw se 21-18n-4w (otd 4993) 677 6075
Oklahoma County—
Sunray, State 11, ne sw ne nw 27-12n-ew (otd 6500) 475 6560
Pottawatomie County—
Sinclair Prairie, Meyer 2, se se se 32-7n-4e (otd 4203) 94 4278
Stephens County—
Skelly Oil, Harmon "A" 2, se nw se ne 27-1s-5w (otd 643) 25 718

Pennsylvania

Armstrong County—
Shelocta Oil & Gas, Cribbs 1..... ¶.19 1809
T. W. Phillips, Beale 2..... • 1650
Watson et al, Smith 2..... ¶.24 3773
Apollo Gas, Gladys Mining Co. 1. ¶.05 3601
Clarion County—
Owens Illinois Glass, Albright 1.. ¶.04 2625
Washington County—
Washington Oil Co., Snodgrass 5.. ¶.13 1435

OLD WELLS DRILLED DEEPER

Greene County—
H. B. Scott et al, McNary 1..... • 2975
Armstrong County—
Apollo Gas, Riggle 1..... ¶.11 3580
Fayette County—
Fitse & Spaugy, Tomosek 1..... ¶.1 1300

West Texas

Andrews County (Emma)—
Montecito Corp., Cowden 1.....1160 4270
Cochran County (Slaughter)—
Atlantic, Boyd-Humble 31.....1227 5065
Honolulu, Igoe-Smith 14.....1019 5025
Igoe-Smith 15 ..... 984 5030
Crane County (Ella Waddell)—
Gulf, Waddell 48 ..... 362 3370
Crane County (Sand Hills)—
Gulf, Waddell et al 34.....2782 4603
Humble et al, Tubb 2-B-X (pb 4400) 343 5788

United States Well Completions—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
Crockett County (Soma-Noelke)—		
Bolsa Chica Oil Co., Bouscaren 1-29	¶59	1171
Ector County (Foster)—		
Cities Service, Bagley 4-B	242	4285
Continental, Johnson 9	238	4266
C. O. Davis et al, Judkins-Atlantic 3	12,710	4385
Sunray Oil Co.-York-Harper, Bagley 3	1143	4410
Ector County (North Cowden)—		
Stanolind, Smith 26-G	428	4380
Hockley County (Slaughter)—		
Honolulu, Mallet 10-A	1191	5078
Magnolia, Mallet 10-E	1074	5020
Mallet 12-E	1203	5034
Mallet 7-F	1054	5030
Mallet 14-G	1483	5020
Stanolind, Slaughter 26-B	279	5015
Slaughter 31-B	268	5037
Texas Co., Cattle Raisers 4	527	5030
Mallet 3-C	1158	5028
TP Coal & Oil Co., Lauhoff 4	720	4998
Uscan Oil Co., Booher 1	422	4955
Pecos County (Abell)—		
Sinclair Prairie, Daley 2 (70.24-ac)	1419	5415
Pecos County (Conry-Davis)—		
Geo. Abell et al, Alexander-State 1 (pb 3774)	22	4015
Pecos County (Pecos Valley)—		
W. H. Waldrop et al, Scharff-Blackman 1	*	2267
Pecos County (Taylor-Link)—		
Sam Letwin et al, University-Amerada 4-E	*	1685
Petroleum Drlg. Co., University 1	*	1682
Milton Unger et al, University-Shell 1-B	*	1716
Pecos County (Tobarg)—		
Stanolind, Tippett 25-B	28	362
Tide Water Associated, Smith 2-T	197	472
Pecos County (White-Baker)—		
Cardinal Oil Co., White-Baker 3-K	49	1976
Reagan County (Big Lake)—		
Big Lake Oil Co., University 18-C	512	8301
Stonewall County (Boyd)—		
Forest Dev. Corp., Boyd 2	*	4753
Upton County (Gulf-McElroy)—		
Gulf, McElroy 260 (pb 3194)	200	3257
McElroy 261	433	2832
Ward County—		
Gulf, Estes 153	618	2940
O'Brien 193	1128	2772
O'Brien 196	135	2733
Winkler County (Keystone)—		
Ralph Lowe et al, Cross 1	260	3320
Hal Peck-J. H. Croft, Campbell-Gulf 2	326	3320
Yoakum County (Wasson)—		
American Liberty, Keller-Texaco 16	272	5166
Drl. & Explo. Inc., Hudson-Shell 3-A	287	5110
Hudson-Shell 4-A	601	5120
Hudson-Shell 3-B	359	5100
OLD WELLS DEEPENED		
Crane County (Gulf-McElroy)—		
Gulf, McElroy 64 (otd 2974)	207	2976
Garza County—		
S. Caprito et al (was Grisham), Sullivan 1 (otd 2840)	15	2900
Upton County (McCamey)—		
T. P. Coal & Oil Co., Lane 37-A (otd 2109)	222	2190

Southwest Texas

CORPUS CHRISTI DISTRICT

Goliad County (Wildcat)—		
Paul G. Benedum, Marshall 1	*	4011
Hidalgo County (Nichols)—		
Phillips, Daskam 1	*	4505
Jackson County (Lolita)—		
Louis Crouch, T. J. Mays 1	25	5975
Humble, L. Ranch 27-A	450	6392
Magnolia, Margaret-Lou	500	5945
Susie Ward (Mitchell) 16	550	6394
Jackson County (Maubro)—		
Humble, Prichett 1	250	5238
Magnolia, Gordin 3, nw outpost	450	5223
Moore & Ahern, Badet 1, se outpost	250	5277
Jim Wells County (Orange Grove)—		
Cities Service, Schuenemann 5	400	5090
Jim Wells County (Seeligson)—		
Magnolia, Seeligson 24	600	6160
Jim Wells County (Wade City)—		
W. C. McBride, Sharke 1	*	5050
Jim Wells County (W. Alfred)—		
H. F. Wilcox O. & G. Co., R. Adams 2, new sd	¶5	4390
Jim Wells County (Wildcat)—		
Bridwell Oil Co., J. P. Blake 1	*	5845
Kleberg County (Stratton)—		
Humble, King-Paso Ancho 4	500	6613
Live Oak County (Oakville)—		
Henderson Coquat, T. Mahoney 1, s outpost	250	2767
Live Oak (S. White Creek)—		
Joe Stelzig et al, J. Turner 1	†	1865
Nueces County (E. Flour Bluff)—		
Humble, Flour Bluff-State 4-E	*	8200
Nueces County (N. Agua Dulce)—		
Ginther, Warren & Ginther, T. Harper 1	150	5750
Nueces County (S. Clara Driscoll)—		
Texas Conservative Oil Co., Taylor 3	350	5431
Refugio County (Wildcat)—		
Hewit & Dougherty, B. D. Rooke 1-C	*	7010
San Patricio County (Midway)—		
Wm. F. Morgan, O. L. Schmidt 4	350	6577
San Patricio County (Wildcat)—		
L. A. Douglas, Ragsdale 1	*	7120
OLD WELL DEEPENED		
Jackson County (Ganado)—		
Texas Co., Mortgage Land & Inv. Co, 2, otd 5100	500	6497

SAN ANTONIO DISTRICT

Bastrop County (Elgin)—		
Marts & Beaven, Elgin Brick 1, outpost	*	3625
Bexar County (Gas Ridge)—		
Ripps Pipe & Supply Co., Sweeney 1, outpost	2½	560
Southwest Dr. Co., M. H. Covell 26	1½	422
Caldwell County (Bee Creek)—		
R. R. Ogden, Miears 3-E	62	2295
Caldwell County (Luling)—		
Danish American Oil Co., Cosey 9	12	2165
Guadalupe County (Day)—		
Dees & Freeland, Day 3	*	2799
Milam County (Wildcat)—		
Chas. Roesner et al, Henninger 1	*	736

LAREDO DISTRICT

Duval County (Casa Blanca)—		
M. L. Massingill, DCRC 1	72	1162
Duval County (Driscoll)—		
Continental, R. Driscoll 74-A	650	3410
Duval County (Hoffman)—		
Cox & Hamon, De Cantu (Gonzales) 3	55	2717
Duval County (Kreis)—		
W. C. McBride, Fite 1, s outpost	*	3292
Duval County (Lopez)—		
Magnolia, D. C. R. C. 3 (902) north outpost	*	3017
Duval County (Piedre Lumbre)—		
Magnolia, D.C.R.C. 37 (100)	111	2130
Duval County (Sweden)—		
Hiawatha O. & G. Co., Miller 12	*	6015
Jim Hogg County (Colorado)—		
C. Andrade III, F. G. Trevino 6-H	425	2893
Humble, King-Colorado 48-B	150	2828
Jim Hogg County (Wildcat)—		
Henshaw Bros., T. T. East 1	*	4315
Starr County (Kelsey)—		
Humble, E. Juarez 1	200	4740
Starr County (Rincon)—		
Continental, Davenport 1-E, outpost	*	5005
Slick 114-A	350	4268
Slick 112-B	500	4180
Starr County (Sun)—		
Sun, G. H. Speer 11	350	4675
Zapata County (Lopeno)—		
W. H. Winn, C. Ramirez 1	¶11	2573

North Texas

Archer County (Griffin-Kadane)—		
K. & G. Production Co., Griffin 2-G	85	4446
Archer County—		
Metzner & Lewis, Andrews 3	10	978
Rathke Oil Co., Roach 3	10	1290
Clay County—		
Bridwell Oil Co., Saner 13	20	1139
Fisher & Kahn, Taylor 5	80	1140
Taylor 6	90	1140
Geo. W. Graham et al, Roach 1	*	1301
Johnson & Kouri, Taylor 1-D	*	1384
Taylor-Elliott 9	40	1141
Perkins & Cullum, Taylor 6-B	50	1058
Clay County (Wildcat)—		
Webb & Taylor Drl. Co., Wagoner 1	*	1806
Jack County (Wildcat)—		
Parker & Farris, Lewis 1	*	3404
Montague County—		
Jack Story Jr. et al, Salmon 4	*	944
Montague County (Clingingsmith)—		
Sinclair Prairie, Hobbs 1	864	5996
Montague County (Wildcat)—		
Continental Oil Co., Winder 1 (pb to 6241)	464	6610
Montague County (Benton-Holmes)—		
United Prod. Co.-Continental, Braman 4	1000	3780
Throckmorton County—		
Fain-McGaha Oil Corp.-Bridwell Oil Co., Hendrick 1	*	2662
R. F. Gilman et al, Kunkel 1	*	675
Wichita County (K-M-A Ellenberger)—		
Murchison & Wynne, River 1-E	1656	4260
Tide Water Associated, Ferguson 10-E	680	4371
Wichita County (K-M-A)—		
Fain-McGaha Oil Corp., Griffin 8-C	648	3830
Hanlon & Buchanan, Fassett-Tuttle 15-E	65	4033
Fassett-Tuttle 28-E	440	4012
Fassett-Tuttle 34-C	480	4080
Wichita County—		
Perry Browning et al, Simpson 1-B	64	1796
Coppock & Coleman, Warren 21	53	1766
J. W. Culbertson et al, Waggoner Bros. 87	*	699
Gray & Palmer Drl. Co., Douglas 1	*	1708
W. H. Hammon-Hanlon-Buchanan, Fassett-Tuttle 49-D	*	650
Chas. E. Morrison et al, Powell 2	10	801
Wilbarger County—		
Phillips, Waggoner 6-H	560	3107
Young County—		
Benson & O'Rourke, Harlan 5 (pb to 3060)	48	3214
Kimmell-Lee & Palmer, Bryant 1	*	964
Rancho Oil Co., Taylor 1	564	4299
OLD WELLS DEEPENED		
Montague County—		
Lesh & McCall, Davenport 1 (otd 1673	320	2506
Wichita County—		
Magnolia, Reilly 29 (otd 743)	10	1315

Texas Gulf Coast

Fort Bend County (Blue Ridge)—		
Mills Bennett, Luscher 10	168	3366
Fort Bend County (Big Creek)—		
John T. Buckley, Buckley 1	19	766
Harris County (Dyersdale)—		
Jack W. Frazier, M. O. Claude 1	176	4080
Harris County (Goose Creek)—		
Grace Oil, H. Busch 3	80	2013
Jefferson County (Wildcat Discovery)—		
Glenn H. McCarthy, Cora Crawford 1	483	9305
Liberty County (Hull)—		
Texas Co., Armelin Fee 3	312	5897
Liberty County (South Liberty)—		
Harris Oil, Chambers 3	42	908
Sadler Production, Mitchell 1	86	965
Matagorda County (Bay City)—		
Skelly, Cobb B-26	182	8513
Matagorda County (North Markham)—		
Ohio, J. C. Carlson 13	169	8125
Wharton County (Magnet)—		
Humble, Cockburn 49	93	5536
Wharton County (Withers)—		
F. W. Michaux, Pierce Est. A-15	210	5410
Wharton County (Wildcat)—		
Seaboard, J. Balik 1	*	7510

East Texas

Anderson County (Cayuga)—		
Carter-Gragg Oil Co., McMahon 8	171	4017
Ellis County (Wildcat)—		
L. W. Little Drl. Co., SW Life 1	*	1026
Joiner Area—		
Hunt Oil Co., Bradford 34-D	240	3649
Longview Area—		
C. H. Lyons-M. V. Rudman, Bolton 4	1500	3545
Shelby County (Wildcat)—		
Grady Vaughn, Frost 1, J. Buckley sur	*	8243
Wood County (Hawkins)—		
Humble, Howard 2 (16¼-ac)	110	4839
Joe Palmer 2 (66.41-ac)	433	4850
A. Surratt 2 (43.21-ac)	416	4887
B. A. Wells 3 (141.78-ac)	450	4605

West Central Texas

Brown County (Wildcat)—		
D. H. Brock et al, Adams 1	*	1078
Brown County—		
Hightower O.&R. Co., Whidden 1	¶0.32	1504
G. A. White et al, Moore 1	*	688
Callahan County (Wildcat)—		
C. B. Holmes et al, Gray 1	*	469
Comanche County—		
L. H. Choate et al, Smith 5	31	638
Eastland County (Wildcat)—		
Miles & Francisco, Mitcham 1	*	644
Jones County—		
M. J. Delaney et al, Swenson 2	*	3300
Thos. D. Humphrey, Triplett 5-A	*	2561
J. L. McMahon et al, Akard 3	25	2148
Merry Bros. & Perini, Wimberly 2	516	2231
W. L. Snoddy et al, Huddleston 1	*	3080
Palo Pinto County—		
E. Lloyd et al, Dalton 1	*	1474
Shackelford County—		
Dickey Bros. et al, Tucker 2	*	501
Hickok & Harry Reynolds, Nail 16-A	*	1698
Grace T. Knight et al, Davis 3-B	116	1595
Stephens County (Wildcat)—		
Tom G. Shaw, Tr., Whalen 1 (pb to 4100)	¶10.4	4707
Stephens County—		
Shertzer Bros. et al, Stuart 27	2	1796

Wyoming

Sublette County (LaBarge)—		
North LaBarge Oil Co., Govt. 3, nw ne ne 17-27n-113w	4	2099
Texas Co., Govt. 2-J, cnl sw sw 27-27n-113w	350	1152
Weston County (Osage)—		
Updike Bros., Govt. 2, nw sw ne 35-46n-64w	28	2163

WILDCAT REPORT
New Starts and Completions

ARKANSAS

FIRST REPORT

LaFayette County — McAlester Fuel Co., Jeffus 1, c ne nw 4-19-23, dk.

CALIFORNIA

FIRST REPORT

Kern County—Frazier, Finley & Associates' Portals Corp. 1, 4-30-29, Edison area rig. Ohio Oil Co.'s KCL A-10, 41-4, 4-32-26, Paloma area, rig.

San Joaquin County—Westates Petroleum Corp.'s Spence 1, 22-1-7, Manteca area, lcn. Standard's West Coast Life 2, 4-1-5, McDonald Island area, lcn.

Santa Barbara County—O. C. Field & William C. McDuffie's Palmer-Stendel 13-1, 13-9-33, Cat Canyon area, lcn.

Ventura County — Robertson & Melton's Runkle 1, 14-2-18, Santa Susana area, lcn.

COMPLETIONS

Kern County—The Texas Co.'s Anderson 1, 19-28-20, recovered mud & salt water on formation test. Top temblor 4660 ft. Abnd 5777 ft, Shale Hills area.

Los Angeles County—Sunset Oil Co.'s Baldwin 1, Lot "C," Tract 4005, trace oil on formation test through perforations 3800 ft, top sand streaks 3500 ft, Kraemer shale, 3888 ft, abnd, 4681 ft, Puente Hills.

San Benito County—Texas Co.'s Carter 1, 3-17-12, abnd 3265 ft, Ciervo area.

COLORADO

COMPLETION

Logan County—Mutual Oil Co.'s State 1, c sw sw 32-7n-51w, Sterling area, elevation 4440 ft, abnd 4840 ft Dakota sand water.

ILLINOIS

FIRST REPORTS

Clay County—Cameron Bros.' Hendy 1, s½ sw ne 24-3n-5e, lcn. A. H. Gibson et al's Harter 1, s½ sw nw 28-3n-7e, lcn.

Coles County—C. E. Green's Link 1, nw nw ne 9-12n-14w, lcn.

Fayette County—Nation Oil Co.'s Reese 1, nw es sw 13-6n-3e, dr.

Franklin County—E. S. Adkins' Old Ben Coal Co. "L" 1, se se se 5-5s-2e, lcn. E. S. Adkins' Taylor 1, ne se sw 25-5s-2e, lcn. J. W. Menhall's Van Horn 1, s½ se se 30-6s-1e, dr.

Jefferson County—Geison's Horton 1, se se nw 27-2s-2e, lcn.

Macoupin County—W. R. Holmes' Watkins 1, sw se ne 23-8n-9w, dr. Harris & Hudson's Breitweiser 1, ne ne nw 27-8n-9w, dr.

Richland County—V. Youngblood's Philbert 1, s½ se se 33-4n-11w, lcn. Benedum & Trees Oil Co.'s Powell 1, e½ nw se 10-3n-10e, dr.

Wayne County—Roy R. Powers et al's Musgrave 1, n½ nw se 19-2s-6e, lcn. N. V. Duncan's Guthrie 1, n½ nw sw 35-1n-5e, dr.

COMPLETIONS

Coles County—B. F. William's Alexander 1, c w½ ne ne 16-11n-7e, abnd 2355 ft.

Effingham County—Albert Day's Hogue 1, nw nw sw 34-9n-4e, abnd 1645 ft.

Fayette County—William H. Brown's Radliff 1, c w½ nw ne 24-7n-1e, abnd 2033 ft.

Franklin County—Bell & Zellers Coal Co.'s Zigler Coal & Coke 1, ne ne nw 19-7s-2e, abnd 2823 ft. Adkins et al's Ice 1, ne nw sw 21-7s-3e, abnd 2955 ft.

Hamilton County—Lion Oil's Mitchell 1, e½ se sw 29-4s-6e, abnd 3525 ft. Kingwood's Johnson 1, s½ se ne 3-5s-6e, abnd 594 ft.

Jackson County—Glenwood Oil Co.'s Truex-Traer Coal 1, e½ se sw 36-7s-2w, abnd 2015 ft.

Jefferson County — Kingwood's Interstate Coal 1, n½ ne nw 4-4s-2e, abnd 2870 ft.

Macoupin County—Fred Mudjett's Goebelt 1, w½ ne se 20-10n-7w, Pottsville sd 436-447 ft, 10 bbls oil, td 447 ft.

Richland County—Pure's Miller 1, w½ se ne 2-3n-9e, abnd 3000 ft.

St. Clair County—Ed Gieck's Goodman 1, ne ne se 5-3s-7w, abnd 490 ft.

Wayne County—Ivan White's Kieffer 1, w½ nw se 2-1s-6e, abnd 3274 ft. B. H. Nation's Hanison 1, w½ sw nw 19-2s-8e, abnd 3497 ft. Seigel's Riggs 1, e½ ne sw 26-2n-8e, abnd 3087 ft.

White County—Stroube Bros.' Hamilton 1, ne se sw 13-7s-8e, abnd 2925 ft. McKee H. Marshall's Bramlet 1, sw nw ne 15-6s-9e, Beth. 2808-2828 ft, td 2832 ft, 38 bbls oil. Tipton's Jolly Est. 1, sw ne sw 21-3s-14w, abnd 3167 ft.

INDIANA

FIRST REPORTS

Gibson County—R. D. Brown, Inc.'s Crecelius 1, ne sw se 36-1s-10w, dr. Joe Engberg's Dugan 1, se se nw 35-2s-9w, dr.

Posey County—Francis Fleming et al's Moorelock 1, nw se nw 26-7s-14w, dr. Howard Martin et al's Hageman 1, nw ne sw 6-7s-13w, dr.

COMPLETIONS

Elkhart County—M. C. Pletcher's Clifford 1, ne se se 13-38n-4e, old td 1929 ft, td 2021 ft, abnd.

Gibson County—R. D. Brown, Inc.'s Antell 1, c ne es 20-1s-11w, McCl. 2259-62 ft, td 2262 ft, pump 259 bbls oil.

Pike County—Irwin & Powderly's McAtee 3, 12-1n-9w, abnd 1670 ft.

Posey County—Carter & Gulf's Maier C-76 1, c n½ ne sw 1-7s-14w, Walt. sd 1965-83 ft, Cyp. 2441-65 ft, pump 766 bbls oil.

White County—Ohio Oil Co.'s Horton Heirs 1, ne ne ne 1-28n-5w, abnd 1638 ft.

KANSAS

FIRST REPORTS

Barber County—Champlin Ref.'s Hildebrand 1, c e½ ne nw 26-32s-15w, rig.

Jefferson County—W. D. Dunn's Boyd 1, ne ne se 22-8s-19e, lcn.

Leavenworth County—Ryan Consolidated's Lanning 1, c sw nw 22-11s-21e, lcn.

COMPLETIONS

Barton County—Phil-Han et al's Grosshardt 1, ne ne se 17-17s-11w, Anhy. 695 ft, Ft. Riley 1655 ft, Topeka 2710 ft, Lansing 3048 ft, Conglom. 3303 ft, Arbuckle 3323-65 ft, td, no show, abnd.

Edwards County—Falcon-Seaboard et al's Newsom 1, nw nw se 1-26s-18w, Anhy. 1220 ft, Topeka 3510 ft, Lansing 4046 ft, Penna sand 4517 ft, Miss. 4540 ft, Kinderhook shale 4560 ft, Miss. sd 4570-4600 ft, Viola 4600 ft, Simpson 4830 ft, Arbuckle 4866 ft, abnd 4938 ft.

Leavenworth County—Mosbacher's Locke 1, c ne sw 19-9s-21e, Hertha 640 ft, Miss. 1366 ft, abnd 1505 ft.

Ness County—Hunt Oil's Ryersee 1, c sw ne 35-18s-21w, Lansing 3616 ft, Miss. 4150 ft, abnd 4300 ft.

Norton County—H&P and Phillips' Central Trust 1, c e½ se ne 25-2s-23w, Anhy. 1885 ft, Topeka 3215 ft, Lansing 3375 ft, Arbuckle 3611 ft, cored 3613-16 ft, show, cored 3616-21 ft, abnd 3628 ft.

Osborne County—Vickers Pet. Co.'s Koelling 1, c s½ se se 31-9s-15w, Anhy. 1184 ft, Top. 2809 ft, Lans. 3163 ft, perf 3222-33 ft, 1000 gals acid, abnd.

Pawnee County—Stanolind's Paramore 1, c s½ n½ se 11-23s-17w, Anhy. 1093 ft, Ft. Riley 2240 ft, Florence 2338 ft, Lansing 3700 ft, Cherty Congl. 4090 ft, Viola 4212 ft, Simpson 4243 ft, Arbuckle 4283 ft, abnd 4343 ft.

Pratt County—Centrol Pet. et al's Ward 1, c e½ se nw 11-26s-12w, Topeka 3487 ft, Lansing 3519 ft, show oil and gas 3617-18 ft, cored 3732-40 ft, no show, cored 3824-31, top 10 inches good porosity, base KC 3950 ft, Miss. 4020 ft, Viola 4105 ft, Simpson 4197 ft, Arbuckle 4278 ft, cored 4282-89 ft, td 4320 ft, pb 4140 ft, 7000 gals acid, gauged 1100 gas, 2000 gals acid, 2729 gas, 1031 lbs.

Trego County — Aylward Prod. et al's Schaefer 1, sw sw ne 10-12s-21w, Heebner 3605 ft, Lansing 3626 ft, base KC 3854 ft, Marmaton 3936 ft, Arbuckle 3984 ft, cored 4000-03, 3 ft, well sat, cored 3997, 450 ft, oil in hole, 35-gr oil, 2750 gals acid, 30 bbls oil and 75 bbls water, new pool.

KENTUCKY

FIRST REPORT

Henderson County — Kentucky Producers Corp.'s Breitschere 1, 23-Q-26, dr.

COMPLETIONS

Breckenridge County—W. J. Flescher et al's Bowen 1, 23Q-35, abnd 467 ft.

Daviess County—Anderson et al's Kindall 1, 10-Q-30, abnd 844 ft.

SOUTH LOUISIANA

FIRST REPORTS

Avoyelles Parish—Placid Oil Co.'s Southwestern Implement Co. 1, Bordelonville area, nw 19-2n-72, lcn; Southwestern Implement Co. 1-B, ne 11-2n-7e, lcn; Penrod Drilling Co. contractor both tests.

COMPLETIONS

Allen Parish—J. A. Hafner Jr.'s Pierre Nevils 1, 1½ mi ne Indian Village on 6000-ac block, ne ne 10-7s-6w, abnd 8014 ft.

Calcasieu Parish—Gulf & Louisiana Progress' Miller et al 2, se flank Edgerly dome, se sw 27-9s-11w, perf 9028-66 ft, liner collapsed, junked 9184 ft.

East Baton Rouge Parish—Texas Progress Oil Co.'s Nelson 1, Longwood area, se University field sec 74-8s-1e, abnd 10,310 ft.

HIGH LIFTING COST?

CALL FOR YOUR

FOR REAL SERVICE

SELECT PRODUCTS MADE BY

DARLING VALVE & MANUFACTURING CO.

WILLIAMSPORT, PA.

NORTH LOUISIANA

COMPLETIONS

Caldwell Parish—Mudge Oil Co., Southern Kraft 1, ne sw 5-11n-4e, abnd 3515 ft.

Catahoula Parish—C. H. Lyons et al, Hargis 1, ne nw 18-7n-6e, abnd 6345 ft; Placid Oil Co., Grant 1, nw sw 21-7n-6e, abnd 6590 ft; Phillips Pet. Co., Tensas-Delta B-3, ne ne 14-5n-5e, abnd 6010 ft.

Concordia Parish—H. W. Elliott et al, Brown 1, ne sw 33-8n-8e, abnd 6587 ft.

LaSalle Parish—N. H. Wheless et al, Louisiana Delta B-1, se ne 3-5n-3e, abnd 6000 ft.

MICHIGAN

FIRST REPORTS

Arenac County—Socony Vacuum's Thoms 1, c e½ ne se 8-18n-4e, dr.

Lake County—W. S. Shoemaker's Reese 1, c e½ ne se 29-19n-14w, dr.

COMPLETIONS

Cass County—A. C. Murray's Berkey 1, sw nw se 19-5s-14w, Traverse 990 ft, abnd 1080 ft.

Gladwin County—Walter L. McClanahan and Cline Bagwell's State 1, c n½ nw sw 14-19n-2e, Dundee 3112 ft, abnd 3233 ft.

Mason County—Merrill and Dean's Renn 1, sw ne se 21-17n-15w, Traverse 1990 ft, abnd 1998 ft.

Mecosta County—American Production Co.'s Trust 1, se nw sw 24-16n-9w, abnd 1489 ft.

Osceola County—Taggart Bros. Co.'s Wirth 1, c s½ ne se 22-18n-8w, Stray 1396 ft, td 1423 ft, 490,000 ft gas; new field.

Ottawa County—W. R. Borough's Halzey 1, ne se sw 21-7n-13w, Traverse 1980 ft, abnd 2011 ft.

Van Buren County—Sun's Buys 1, se se se 5-3s-14w, Traverse 1120 ft, abnd 1315 ft.

MISSISSIPPI

COMPLETION

Lawrence County—Tide Water Associated Oil Co., Denkman Lbr. Co. 1, se se 5-5n-11e, abnd 10,808 ft.

MONTANA

FIRST REPORT

Liberty County—Briggs et al's Smith 1, c ne nw 22-37n-7e, Lost Creek, dr 606 ft.

NEW MEXICO

COMPLETION

Eddy County—Trojan Oil Co.'s Grant 1, swc ne 33-20s-25e, elev 3632 ft, top black lime 1702 ft, abnd 2600 ft.

OKLAHOMA

FIRST REPORTS

Comanche County—Texas Co.'s Reich 1, c nw nw ne 25-4n-11w, dr.

Love County—Walter Neustadt's Wilkins 2, ne nw nw se 8-6s-2e, lcn.

Oklahoma County—Willie Anderson's Purcell 1, c nw se 9-13n-2w, woc.

Osage County—Cities Service's Osage 1, se se nw 10-23n-7e, permit. Norbla Drlg.'s Osage 1-1 c nw nw se 6-24n-6e, permit.

Pottawatomie County—Cities Service's Ft. Cobb Oil Co. 1, sw ne ne 4-8n-3e, lcn.

COMPLETIONS

Comanche County—Texas Co.'s Gamble 1, sw ne se 5-3n-10w, Garber 490 ft, Wichita Albany 690 ft, sand show oil 1901 ft, cored 3829-39 ft, lime and stain, Wood 4128 ft, and 5752 ft, top Syc. 5752 ft, Miss-Caney 5893 ft, Schlumberger abnd 6276 ft. Texas Co.'s School Land B-1, c sw sw 13-4n-11w, Garber 284 ft, Wichita-Albany 687 ft, Pont. 803 ft, Viola 1495 ft, lm stain 1630-60 ft, cored 1663-74 ft, rec 9 ft lime, packer at 1625 ft, open rec 60 ft, mud base Viola 2735 ft, Sylvian Dolomite 3103 ft, Syl. shale 3125 ft, Mid-Hunton 4040 ft, Wood 4055 ft, Syc. 4264 ft, Miss. Caney 4352 ft, abnd 5233 ft.

Creek County—Deep Rock et al's Meadors 1, sw nw ne 16-15n-7e, Miss. 3445 ft, Wd. 3821 ft, Sylv. 3853 ft, Viola 3906 ft, Dense 3933 ft, Dolo. 3935 ft, show in Dolomite 3951 ft, oil in hole 3952 ft, Dense 3933 ft, Dolo. 3935 ft, first oil 3950 ft, 2nd Dolo. 3966 ft, Sdy. Dolo. 3970 ft, 2nd Wilcox 3973 ft, td 3984 ft, some water completed flow 85 bbls oil; new pool, ne Stroud. Shell's Bishop 1, ne ne sw 12-15n-8e, Viola 3621 ft, Dense 3652 ft, Wilcox 3675 ft, td 3790 ft, pb 3185 ft to Dutcher, perf 3083-91 ft, completed 10,100 gas 7 bbls water per hr, new gas area.

Dewey County—Ruso Drlg. Co.'s Senter 1, se se nw 5-16n-17w, 1st Dutcher 659-71 ft, 2nd Dutcher 855 ft, Pitkin 925-1075 ft, top Miss. 1160 ft, Wilcox 1389-90 ft, no show, Tyner 1417 ft td, hole full water, abnd.

Hughes County—Barnsdall's Skinner 1, se sw nw 11-9n-10e, Senora lm. 855 ft, brn lm 2075 ft, Booch 2290-2318 ft, water, Glic. zone 2566 ft, Wap. 3862-65 ft, sdy Wap. 3065 ft, cored 3068-84 ft, Wood. 3658 ft, Mise. 3684 ft, Hunt. 3687 ft, salt water, td 3694, abnd.

Love County—Walter Neustadt et al's Wilkins 1, sec 8-6s-2e, sandy shale show oil 1947-59 ft, sandy shale 1959-74 ft, odor oil, shaley sd 1947-89 ft, stain oil, sd 1989-2007 ft, sd 2007-21 ft, Schlumberger sand, cored 2321-29 ft, rec 5 ft hard, tight sand, td 2505, abnd.

McClain County—Patsy Oil Co.'s Caldwell 4, se ne se 16-5n-3e, ran Jeep 3462 ft, stain 3530-70 ft, Viola 3530 ft, Belle Cy. 2250 ft, Hogs. 2590 ft, Lay. 2697 ft, Hunt. 3368-80 ft, Viola 3530 ft, td 3697 ft, flow 70 bbls oil per hour, completed for 278 bbls oil. Extends Byars pool.

Okfuskee County—W. H. Allen's Camp 1, se ne sw 18-11n-10e, Booch 3045 ft, Cromwell 3445 ft, Mayes 3835 ft, td 4020 ft, pb 3480 ft, dd 3448 ft, 200 ft water in hole, abnd.

Payne County—Halko's Goebbel 1, se nw ne 8-17n-1e, Deer Creek 1935 ft, Avant 3095 ft, Dewey 3225-80 ft, Perry gas sand 3310-20 ft, Hogshoot 3790 ft, OC ccb 3920 ft, Ccb 4076 ft, Osw. 4385-4565 ft, Inola 4720 ft, Miss. 4807 ft, Chatt. 4917 ft, Meis. 4961 ft, Hunton 4975 ft, test 4975-5007 ft, 40 ft gas cut mud, Sylv. 5012 ft, Viola 5096 ft, Dense 5132 ft, Wilcox 5169 ft, 4962-70 ft in Meisner best, 2nd Wilcox 5240-44 ft, sdy sh 5244-61 ft, sd 5261-78 ft, td, abnd.

Pontotoc County—Lake Oil Co.'s Moore 1, se nw ne 28-5n-4e, broken sd, 2335-50 ft, Hunton 2383 ft, Syl. 2540 ft, Viola 2672 ft, Trenton 2731 ft, drlg 2896 ft, abnd.

Texas County—Peerless O&G's Hopkins 1, s½ nw ne 7-4n-18 ecm, before acid 2300 mfg, 5000 gals acid, 5500 gas, 300 lbs, rp.

TEXAS GULF COAST

FIRST REPORTS

Chambers County—Rowan Drilling Co.'s Arthur Nelson 1, South Anahuac area, S. P. Donley 467 ft fr wl lse and on center line between Donley & Martin surveys, 9500 ft test.

Harris County—Atlantic's Cohn 1, Esperson Dome area, Meredith Duncan sur, 150 ft w & 150 ft s of intersection of nl of tract with west bank of Cedar Bayou, on 248-ac lse, 9000-ft test, prep to drill.

Texas Co.'s Harris County Land and Implement Co. 1, 8 mi e Humble, Victor Blanco sur, blk 19, rigging 5500-ft test.

Matagorda County—Continental's Doman 1, 2 mi n Elmaton, John Partin lge on 735-ac tract, prep to drill 10,000-ft test.

COMPLETIONS

Jefferson County—G. H. McCarthy's Crawford 1, 3 mi e Stowell, se T&NO 158, top sand 8850-8967, td 9305, opens field, flowed 483 bbls 34.8 gr oil, ¼-in choke, tp 775, cp 1600, gor 400/1, perf 8850-80 ft with 72 shots, had another sand 8575-8615 in Marginulina showing saturation.

Wharton County—Seaboard Oil Co.'s Balik 1, 3½ mi nw Danevang, E. L. Wilson sur, abnd 7510 ft.

EAST TEXAS

FIRST REPORTS

Anderson County—Navarro Oil Co. et al's Davey-Royall 1, nwc of 44-ac tr, C. Rucker sur, 4 mi nw Jarvis, lcn.

Freestone County—C. W. Killough et al's Ball 1, 300 ft out of m/e swc of 1631-.8-ac tr, Manuel Rionda sur, 1 mi ne Turlington, rur.

Rains County—E. B. Germany et al's Collins 1, c of s 41 ac of 67-7-ac tr, Joel Hamm sur, mim.

Red River County—C. B. Morris et al's S. Stanley 1 sec 50-ac lse, W. P. Snell sur, rur.

COMPLETIONS

Ellis County—L. W. Little Drl. Co.'s SW Life Insurance 1, 600 ft from s line 172-ac tr and 500 ft from Cummings Creek, Gideon White sur, abnd 1026 ft.

Shelby County—Grady Vaughn, Frost 1, J. Buckley Sur, abnd 8243 ft.

SOUTHWEST TEXAS

FIRST REPORTS

DeWitt County—Adams O. & G. Co.'s E. Berch et al 1, 350-ac lse, J. Kimberling sur, 3 mi e Yorktown, lcn 10,000-ft Wilcox test.

Duval County—W. C. McBride's Fite 1, 3750 ft e & 467 ft s fr sw cor sec 78, but in sec 87, 2 mi sw Kreis fld, set sur csg 3300-ft test.

Frio County—Wiegand Bros.' Gilliam 1, 1¼ mi e Pearsall fld, lcn 4000-ft test.

Jim Wells County—Bridwell Oil Co.'s Blake Jr. 2, 400-ac lse, LaTrinidad Gr, 4.2 mi sw Ben Bolt, dr below 1500 ft on 4500-ft test. Kilgore Dev., Inc.'s Schmidt 1, 217.46-ac lse, Casa Blanca sur, 3 mi ne Orange Grove, lcn 5700-ft test.

San Patricio County—Henshaw Bros.' Smith 1, 467 ft nl & wl Sec 57, Pauls sub, Welder ranch, 2 mi s Edroy, lcn 7000-ft test. Texas Co.'s Carroll 1, sw sec 11, 3½ mi ne Taft, lcn 6000-ft test.

Starr County—A. T. Espenlaub's Bass 1, blk 1, B & B sur, Por 86 & 87, 7 mi e Rio Grande City, lcn 2000-ft test.

COMPLETIONS

Duval County—W. C. McBride's Fite 1, Sec 87, 2 mi sw Kreis fld, abnd 3292 ft. Magnolia's DCRC 3, BS & F sur 902, 15 mi sw Freer, abnd 3017 ft.

Goliad County—Paul G. Benedum's Marshall 1, W. P. Smith sur, 5 mi n Goliad, abnd 4011 ft.

Jim Hogg County—Henshaw Bros.' East 1, Noriacitas gr, 2½ mi sw Hebbronville, abnd 4315 ft.

Jim Wells County—Bridwell Oil Co.'s Blake 1, La Trinidad Gr, 4.2 mi s Ben Bolt, abnd 5845 ft.

Refugio County—Hewit & Dougherty's Rooke 1-C, Blk 3, John James sur 3 mi w Refugio, abnd 7010 ft.

San Patricio County—L. A. Douglas' Ragsdale 1, Lot 15, Gravis sur, 7½ mi sw Taft, abnd 7120 ft.

NORTH TEXAS

FIRST REPORTS

Archer County—F. T. Johnson et al's Wilson 1, 1320 ft from n and 330 ft from w ATNC sec 83, lcn.

Clay County—J. M. Seaberry and H. B. Duncan's Tucker 1, 2130 ft from w and 150 ft from n lines e-753-ac tr, C. F. Stanley sur A-407, lcn.

Wichita County—Geo. Cooper-W. B. Omohundro's Obenhaus 1, nwc of south 283-ac tr, MEP&P Ry sur A-230, rur for Ordovician test.

COMPLETIONS

Clay County—Webb & Taylor Drl. Co.'s Waggoner 1, 1000 ft from n and 600 ft from e lines blk 32, Byers sur, abnd 1806 ft.

Jack County—Parker & Farris' Lewis 1, swc blk 2, Navarro CSL sur, Palo Pinto lime 1165-1330 ft, abnd 3404 ft.

Montague County—Continental's Winder 1, nec of s 60 ac of n 100 of w 160-ac tr, limestone SCL sec 4, new pool 2 mi e Stoneburg, top Bend 6039 ft, Mississippian 6504 ft, td 6610 ft, pb and perforated 20 shots Bend Saturation 6233-41 ft, flowed 464 bbls oil natural ¼-in choke.

WEST TEXAS

FIRST REPORTS

Crockett County—Ungren & Frazier's Noelke 1, 745 ft from s and 584 ft from w lines 80-ac lse, sec 54, W.M.B. Lewis sur, sp on 4000-ft test.

Culberson County—S. P. Williams et al's Barfield 1, c n½ nw ne PSL sec 20, blk 82, lcn.

Dickens County—Isaac Deck et al's McMahon 1, near c s½ nw nw H&GN sec 319, blk 1, lcn.

Pecos County—Magnolia's Price 1, sec n½ H&GN sec 4, blk 12, rur Ordovician test. Anderson-Prichard Oil Corp.'s Bowen-Humble 1, c n¼ of e¼ H&GN sec 60, blk 10, rur Ordovician test.

Ward County—Stanolind's Byrd 1, c w¼ of s¼ H&TC sec 34, blk 34, mim.

Yoakum County—Dunigan Bros. & Brahaney's Henard 1, c ne ne sec 367, blk D, J. H. Gibson sur, lcn.

William M. Barret, Inc.

Consulting Geophysicists

Specializing in Magnetic Surveys

Contracts accepted for domestic and foreign projects, using the most improved instrumental and interpretative technique.

GIDDENS-LANE BUILDING
SHREVEPORT, LOUISIANA

THE FORT WORTH LABORATORIES

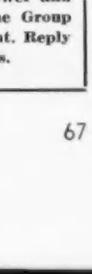
Analysis of oil field brines, cores, gas, oil, and minerals. Field gas testing. R. H. Fash, Vice President; Long Distance 138. 823½ Monroe Street, Fort Worth, Texas.

HOUSTON LABORATORIES

Analytical and Consulting Chemist

Podbielniak Gas Analysis
Oil Field Brines, Waters and Cores
Complete Evaluation of Crude Oils
Long Distance 267, Box 132, Houston, Tex.

GOKEY BOTTE SAUVAGE
REG. U. S. PAT. OFF.
"The best all-around boot in the world"
Manufactured Since 1850



Water - Proof, Genuine Pac Moccasin, Hand Sewed, Made to Measure. A pound or two lighter than the average boot; easy to put on and take off; no hooks to catch. Ankle strap holds boot in place, and also acts as ankle support.
Write for measure blank and Footwear Catalog.
GOKEY COMPANY
Dept. 33 St. Paul, Minnesota

WANTED—Electrical Designing Draftsman, specify materials, equipment and layout oil refinery distribution, power and lighting circuits. Mostly Class One Group D work. Present outlook permanent. Reply to P. O. Box 2527, Houston, Texas.

TWO TO FOUR TIMES TOOL JOINT LIFE

WITH FLAME-HARDENED TOOL JOINTS AND WEAR SUBS

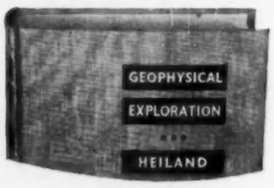
See Article This Issue—
"EXTENDING TOOL JOINT LIFE"

FLAME-HARDENING
REBORING
RESIZING

All Types and Sizes
New and Used Pump Liners

OXY-ACETYLENE TREATING CO.
Precision Flame Treating
402 N. Bryan St.
Telephone W-6-5541
HOUSTON, TEXAS

The Most Complete and Versatile Geophysics Book Ever Published!



THE ONLY BOOK THAT

Gives the fundamentals of geophysics, in non-technical language, for use by geologists, oil and mining engineers, and petroleum geologists (Part 1).
Presents the most complete, thorough and scientific treatment of all aspects of geophysics ever achieved (Part 2).

BROAD DIVISIONS OF THE BOOK

Methods of Geophysical Exploration—Measurement Procedures — Geophysical Methods in Mining—Applications of Geophysics in Engineering — Gravitation Methods — Magnetic Methods — Seismic Methods—Electrical Methods—Geophysical Well Testing—Miscellaneous Geophysical Methods.

Over 500 illustrations—1013 pages—$10

"It fulfills exactly my aim in ordering the book, namely, to have at hand in a single volume the basic theory and practice of geophysical prospecting in its various forms."
—Reverend James Kline, St. Edward's University

Send orders to

THE GULF PUBLISHING CO.
P. O. DRAWER 2608 HOUSTON, TEXAS

MEN IN THE INDUSTRY'S NEWS

B. R. BAY, president of Northern Natural Gas Company, Omaha, Nebraska, was chairman of the general program committee of the natural gas section of the American Gas Association which met recently in Kansas City and drafted plans for a program designed to meet the extraordinary war problems facing the natural gas industry. The program was laid out in preparation for the annual convention at New Orleans, May 4-7, 1942. It is intended to arrange full discussions on war problems as they apply to production, transmission and sale of natural gas.

Committees participating in the Kansas City meeting were: natural gas production, C. U. Daniels, chairman, vice president, Oklahoma Natural Gas Company, Tulsa; natural gas transmission, B. M. Laulhere, chairman, technical supervisor, Southern California Gas Company, Los Angeles; residential natural gas sales, C. B. Wilson, chairman, new business manager, Arkansas Louisiana Gas Company, Little Rock; industrial and commercial natural gas sales, D. W. Reeves, chairman, industrial sales manager, Oklahoma Natural Gas Company, Tulsa.

N. W. SHIARELLA of Owensboro recently was elected president of the Kentucky Oil & Gas Association to serve in 1942. Vice presidents are M. A. Arvin, Owensboro, M. G. Powers, Huntington, West Virginia; and P. C. Van Gilst, Ashland, Kentucky. E. L. McDonald, Lexington, was elected secretary, and Paul D. Dushong, Owensboro, was named assistant secretary-treasurer.

Directors are: M. A. Arvin, Snowden & McSweeney Company, Owensboro; Joshua Bailey, Joseph B. Mayer Company, Owensboro; O. F. Beaty, Magnolia Petroleum Company, Evansville, Indiana; George C. Collins, Collins Oil Company, Frankfort; Ralph E. Damp, Carter Oil Company, Mattoon, Illinois; W. T. Davis, Aetna Oil Company, Louisville; John T. Deiderich, independent, Ashland; H. T. Downing, Onsel Brothers & Downing, Bowling Green; E. C. Dyer, independent, Lexington; E. J. Evans, Evans Oil & Gas Company, Paintsville, Kentucky; M. W. Fowler, South Penn Oil Company, Irvine, Kentucky; I. G. Grettum, United Carbon Company, Charleston; W. J. Hightower, Warfield Natural Gas Company, Charleston; A. V. Hoenig, Hoenig Oil Company, Bartlesville, Oklahoma; O. H. Horne, Inland Gas Company, Ashland; W. E. Hupp, Hupp & Duff, Lexington; C. Taber Johnston, Mecca Oil Company, Owensboro; W. H. Keffer, Ashland Oil & Transportation Company, Ashland; J. J. McClelland, Ohio Oil Company, Owensboro; E. L. McDonald, Ashland Oil & Refining Company, Lexington; J. Fred Miles, The Petroleum Company, Louisville.

J. C. Miller, Creek Drilling Company, Owensboro; Carl A. Morrison, Producers Pipe Line Company, Owensboro; J. W. Polkinghorn, Kentucky Natural Gas Corporation, Owensboro; M. G. Powers, Bed Rock Petroleum Company, Huntington; E. J. Reading, Sun Oil Company, Evansville; E. G. Robinson, Shell Oil Company, Centralia, Illinois; C. W. Rockhold, South-Eastern Gas Company, Charleston; H. W. Ross, independent, Tulsa; R. C. Rowan, Warfield Natural Gas Company, Charleston; N. W. Shiarella, Miller & Shiarella, Owensboro; W. K. Snyder, Stewart & Snyder, Owensboro; P. C. Van Gilst, Kentucky-West Virginia Gas Company, Ashland; O. W. Van Petten, Columbian Fuel Company, Charleston; H. C. Wakefield, The Texas Company, Pryse, Kentucky; Earl D. Wallace, Petroleum Exploration, Lexington; C. J. Weideman, Cumberland Petroleum Company, Owensboro; K. Z. Wilking, W. E. Hupp, Owensboro; J. Frank Wilson, Sohio Corporation, Mt. Vernon, Illinois; J. A. Yunker, Louisville Gas & Electric Company, Louisville.

KURT H. de COUSSER of Lansing, in charge of Socony Vacuum Oil Company's Michigan division, was elected president of the Oil and Gas Association of Michigan for 1942. He succeeds George W. Myers, Sun Oil Company, of Toledo. de Cousser served as vice president this year. James C. Graves of Saginaw, Basin Oil Company, was elected vice president; George Talbot, Talbot Oil Company and W. P. Clarke, Gulf Refining Company, both of Saginaw, were re-elected co-treasurers; and W. B. Pardoe, Dapar Oil Company, Grand Rapids, was reelected secretary.

J. W. SCHMOTZER, Arkansas Fuel Oil Company, has moved from San Antonio to Houston, and James K. Rogers, Arkansas Fuel Oil Company, has been transferred to San Antonio.

JACK DANCIGER, vice president of Danciger Oil & Refineries, Inc., Fort Worth, has been appointed honorary consul of Mexico for Fort Worth.

RALPH R. HAYES has been appointed eastern district sales manager of The Buda Company. He will be attached to the New York office with headquarters at 253 West 64th Street.

C. V. MILLIKAN, chief engineer, Amerada Petroleum Corporation, Tulsa, Oklahoma, addressed the student section of the American Institute of Mining Engineers at the University of Texas recently on "Practical Aspects of Bottom-Hole-Pressure Measurements."

GILBERTO DELGADO, who received his petroleum engineering degree at the University of Oklahoma in the spring of 1940, and who since that time has been working with The Carter Oil Company, is sailing for his home in Colombia, South America, where he expects to become associated with the oil industry.

IKE LOVELADY of Black, Sivals & Bryson, Oklahoma City, addressed the Seminole, Oklahoma, Chapter of the American Petroleum Institute December 15 on "Emulsions, Their Cause and Cure."

JOHN P. WEST, 45, West Texas-New Mexico district land man for Amerada Petroleum Corporation, was fatally stricken December 12 at Midland, where he had resided the past 6 years. He was previously with Prairie Oil Company.

THE SEAL RING for Forged Steel Type Unibolt Couplings Is Easily Removed for Replacement . . . Does Not Freeze or Wedge in the Groove.

UNIBOLT
THE ONE BOLT COUPLING

THORNHILL-CRAVER COMPANY
HOUSTON

PIONEERS IN
Well Servicing

Patented Portable Derricks and Rigs

With our Patented Portable Derrick we arrive at your well with complete rig and derrick, ready to service it in the most efficient and economical manner. Our complete portable equipment and experienced personnel assures satisfactory reworking; also tubing pulling, swabbing and bailing.

DAY AND NIGHT SERVICE

OILFIELD SUPPLY CO., INC.
YORK

You furnish the well . . . Let us do the rest

Kilgore, Texas Phone 1033 | Houston, Texas Woodcrest-6-8301 | Lake Charles, La. Phone 3664

FOR SALE

OIL STORAGE TANKS

3—55,000 Bbl.
1—25,000 Bbl.
5—10,000 Bbl.
3— 5,000 Bbl.
4— 2,500 Bbl.
1— 1,000 Bbl.
2— 750 Bbl.
2— 600 Bbl.
2— 1,200 Bbl. Agitators

Can be inspected at Middlesex Refinery Company, Raritan, N. J.

Address your inquiries to

Dulien Steel Prod., Inc.
2280 WOOLWORTH BLDG.
NEW YORK CITY, N. Y.
TELE. CORT. 7-4676

ARCH F. CAMPBELL has been appointed manager of sales of Superior Engine Division, National Supply Company, with headquarters at Springfield, Ohio. Previous to his appointment Campbell was branch manager at Tulsa for Waukesha Motor Company. He has been affiliated with the oil industry for 22 years in the Mid-Continent.

Following graduation from the University of Michigan in mechanical engineering in 1918, he entered the United States Army as flying officer. Following his discharge he became associated with M. J. Sullivan, oil producer at Ranger, Texas, and in Indiana, and in 1920 joined the production department of Phillips Petroleum Company.

From 1921 to 1931 Campbell was associated with Fenwick Reddaway Manufacturing Company, Newark, New Jersey, as oil field sales representative.

In 1932 he represented Michigan Valve & Foundry Company, in the oil field, and later in the year joined C. F. Camp Company, Tulsa, as Waukesha factory representative. For the past 9 years he has been in charge of the Tulsa branch of Waukesha Motor Company.

LYLE E. KESSELMAN, for the past six years Fluid Packed Pump Company's field representative in the Los Angeles basin district, has been advanced to advertising manager and head of the foreign sales department.

Kesselman first came to California late in 1920 to establish a branch plant for Kesselman and Company of Butler, Pennsylvania, and Parkersburg, West Virginia. Following the Santa Fe Springs activity in 1925, he entered the drilling and production phases of the oil business and has continued active in all lines ever since. In addition to drilling his own wells, he gained wide experience in other firms as engineer, toolpusher and drilling and production superintendent in both California and Texas. His oil career also includes some two years each in the technical and manufacturing departments of oil companies.

LOUIS F. SATTELE, superintendent of pipe mills at the National Works of National Tube Company, McKeesport, Pennsylvania, has been awarded the J. E. Johnson, Jr., award for 1941 by the American Institute of Mining and Metallurgical Engineers. The honor was conferred in recognition of Sattele's development and application of fundamental slag data to blast furnace operation. The award will be presented at the A.I.M.E. annual meeting in New York City, February 11, 1942.

F. M. YOUNG, president of Young Radiator Company, Racine, Wisconsin, recently was elected an honorary member of Alpha Chapter of Pi Tau Sigma, honorary mechanical fraternity, at a formal initiation ceremony and banquet at University of Wisconsin, Madison.

BART A. MYERS, executive of Imperial Oil, Ltd., and International Petroleum Company, was in Houston early in the week on his way back to Toronto from Colombia and Peru.

OIL & GAS WELL
TORPEDOES

Special Equipment for Trouble Shooting

All shots safely and accurately placed with the Howard Greene Line Indicator. Patentee of the Bolshevick Greene Cave Catcher.

Our Modern Equipment and Experience Is Your Guarantee of

Safety - Accuracy
Satisfaction

Dial 8-4875

W. C. Duncan . . . 5-7366
Gordon H. Greene . . 5-9980

HOWARD GREENE
TORPEDO CO.
5501 North Eastern
Oklahoma City, Okla.

FITLER
PURE MANILA
ROPE

Fitler Pure Manila Rope is made from Long Pure Manila Fibre. It is uniform in size and contains the exclusive Fitler self-lubricating feature which guards against internal friction. It is also treated with a natural color Water Repellent Preparation which insures flexibility under all conditions and protection from the outside elements.

Look for the Blue and Yellow Colored Yarn Trade Mark, No. 245091, Reg. U. S. Pat. Office, on the outside of ⅝" diameter and larger sizes; on the inside of all smaller sizes.

(See Page 753 of the Composite Catalog)

Manufacturers of Quality Rope for Over a Century

THE EDWIN H. FITLER CO.
PHILADELPHIA, PA.
Established 1804

Squeaks from the Bull Wheel

War Reports

Thinking the Marines on Midway Island might be running short of supplies, and finally getting in communication by radio with them, headquarters asked, "What shall we send you?"

The Leathernecks called back: "Send us some more Japs!"

Over on Wake Island, four Marines were playing bridge when the lookout called that 50 Japs had landed on the beach. The four players looked at each other, and then one of them said, "Okay, I'll go; I'm dummy this round."

Not Serious

"Girlie, I have a confession to make. I'm a married man."

"Gawd! You had me frightened. I thought you were going to say this car didn't belong to you."

Pertinent

Pierre Renaudel, late French socialist deputy, was a veterinary surgeon before he entered politics.

One day a fellow-deputy, an aristocratic individual who envied Renaudel for his large success and popularity, approached him in a crowded corridor of the chamber, and in a loud and insulting tone inquired, "Are you really a vet?"

"Why do you ask, my dear colleague? Are you ill?"

Just Imagination

"Any insanity in your family?"

"Well, no, only my husband imagines he is the head of the house."

Style

"It says here in the paper that in Egypt women carry baskets of fruit on their heads."

"That's nothing so remarkable. Women do that over here and call 'em hats."

His Best Prospect

"Don't look so down in the mouth. I know it's difficult at first, but you'll soon get into it. When you've had a little more experience you'll get along all right."

"It isn't that. When I got home last night, I practiced that sales talk on my wife, and now I've got to buy her a new vacuum cleaner."

Wasted Time

"Do you think a man should tell all his thoughts and actions to his wife?"

"That would be a waste of time. She already knows all his thoughts, and the neighbors will keep her informed of his actions."

Legal Decorum

"Is you de judge ob reprobates?"

"Well, I am the probate judge, if that is what you mean."

"Yas suh, dat's it, Ah 'spects. Well Judge, it's like dis—mah husban' has done died detested, and lef' me with seven little infidels, and Ah wants to be appointed as de executioner."

Protected!

A tourist in Florida was reclining lazily in the shade of a palm tree, while he fished in a small, clear lake. He confided to his guide that he wanted very much to go in swimming, but feared the snakes.

"Oh, there ain't any snakes in there," replied the guide. "I can guarantee that."

The tourist gleefully divested himself of his clothes and swam about for half an hour. Coming out to dress, he looked out at what he had taken to be several logs floating upon the water, and found them to be in motion.

"I wonder what causes those logs to move?" he mused.

"Them ain't logs," replied the guide, calmly chewing upon a palmetto leaf, "them's alligators. That's how come there ain't no snakes in hyah—'gators keeps 'em et up."

Ahem!

A young lady, finding herself stranded in a small town, asked an old man at the station where she might spend the night.

"There ain't no hotel here, but you can sleep with the station-agent."

"I'll have you know I'm a lady."

"So is the station agent."

Problem

An Irishman went into the postoffice to mail a letter to his fiancee. He paused in perplexity before three letter-slots bearing the words, "City," "Domestic," and "Foreign."

"Maggie's a domestic, she lives in the city, and she's a foreigner. What beats me is how I'm going to get this letter in three holes at wanst!"

He Saw Wood

"Olaf, you say you were working in the saw mill the day of the crime; tell the jury what you saw."

"Vot I saw! I saw wood, py golly! Vot you t'ink I saw . . . stone?"

An Enterprising Fellow

The fellow announced to a group of friends that he had been made manager of a branch bank. One friend looked skeptical.

"You couldn't hold a job like that," he remarked. "What have you ever managed before?"

The fellow smiled condescendingly.

"I managed to marry the president's daughter."

Plus Luxury Tax

The proprietor of a highly successful optical store was instructing his son, new to the business, on how to go about charging the customer.

"Son," he said, "after you have fitted the customer with glasses, and he asks what the charge will be you say, 'The charge is $10.' Then pause and wait to see if he flinches.

"If the customer doesn't flinch, you then say. 'That's for the frames. The lenses will be another $10.'

"Then you pause again, this time only slightly, and watch for the flinch. If the customer doesn't flinch this time, you say, firmly, 'Each.'"

Never Lost

"Now, Sandy McDorr, tell me where the elephant is found."

"The elephant, teacher, is such a large animal it is scarcely ever lost."

Cook It Some More

"I just lost a bet and I want to get a soft hat."

"This is the softest hat we have."

"What I want is something a little more tender. I've got to eat it."

Gott
WATER COOLER
Gotkool
WATER CANS
& COOLERS
GOTT Water Coolers are the convenient way to keep drinking water handy to the worker, protect it from impurities. Their exclusive construction keeps water cool for long periods. Snug fitting large removable top, handy non-leaking push button faucet. GOTT Water Cans for handy field use. Your Supply Store has them, get one today! . . . .
GOTT WATER COOLER
Made in 3, 5, 8, 10, and 20 gallon sizes.
GOTT WATER CAN
Made in 1, 3, 5 and 10 gallon sizes.
H. P. GOTT MFG. CO.
WINFIELD, KANSAS
KEEP PURE DRINKING WATER ALWAYS HANDY

NOTES FOR THE Equipment Buyer and User

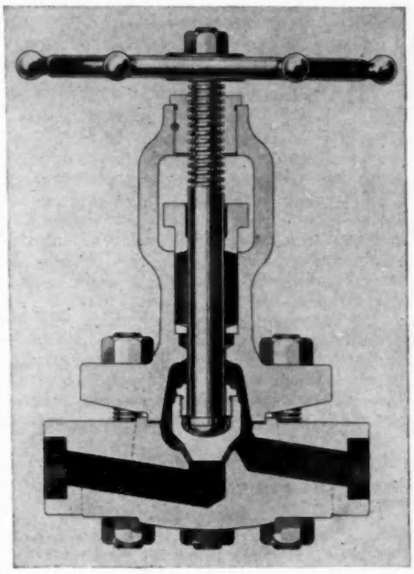
Seat Valves

THE EDWARD VALVE & MANUFACTURING COMPANY, INC.

The Edward Valve & Manufacturing Company, Inc., East Chicago, Indiana, announces a hard surfaced integral seat globe stop valve for pressures to 1500 pounds at 950° F.

Carrying the trade name Intex (Integral Seat Valves of Extra Value) these globe valves are specifically designed for high pressure and high temperature service and incorporate many unique design features. The disk and integral seat are faced with Stellite, a high hardness alloy, which is extraordinarily resistant to both erosion and corrosion. Minimum weight with abundant strength has been accomplished by equalizing the distribution of metal around the body flow areas so that in heating and cooling there is no distortion. Disassembly is unusually easy, requires no special tools, and working parts are readily accessible.

Edward Intex valves are available in ¼- to 2-inch sizes in socket welding, flanged or screwed ends. Complete details are given in the new Intex folder, Section G5.



Edward Valve

Turret Lathe Tools

GISHOLT MACHINE COMPANY

Gisholt Machine Company, Madison, Wisconsin, has announced two new tools for turret lathes. One, an end-facing and forming tool, is used for facing, forming, and chamfering the ends of shafts, studs, bolts, screws. The second, a pointing tool, similar in construction, provides a quick means of chamfering the ends of such work pieces for true starting on a single- or multiple-cutter turner.

Gisholt Turret Lathe Tools; At left, End Facing and Forming Tool; At right, Pointing Tool.

On each tool the rollers, mounted on needle bearings, are easily set for diameter, and support the work accurately and rigidly. Substitution of a roller support assembly equipped with straight rather than bevel rollers converts the pointing tool into an end facing and forming tool; both tools may be used for light turning by substituting the proper cutter. Ample cutter room is provided in each case.

Motors

Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pennsylvania, has issued folder F-8623 describing small motors from 1/6 to 1/2 horsepower, 145 frame size, for general use.

The standard parts making available more than 5000 combinations of type, rating, and mounting are described and illustrated. Charts show motor characteristics plotting percent synchronous speed against percent full load torque.

Features conducive to long motor life and low maintenance are discussed along with construction details. Thermoguard protection against overloads and excessive temperature is explained. Blackline drawings give the necessary physical and mounting dimensions.

Merco, Pittsburgh Equitable Open Two New Offices

Merco Nordstrom Valve Company and Pittsburgh Equitable Meter Company have opened new sales and engineering offices at San Francisco and Seattle.

Russ Waters has been appointed branch manager of the San Francisco office, which is located in the Hobart Building, 582 Market Street. He will be assisted by Fred D. Webster, R. L. Ford and Gilbert T. Bowman in covering Northern California and Nevada.

The Seattle office will be under the jurisdiction of the San Francisco sales office. It has been established at 110 West Denny Way, out of which will work Frank P. Tangney and William R. Dominick, serving Oregon, Washington and Idaho.

Hereafter, sales activities in the Bay District will be directed from the San Francisco office instead of from the companies' plant at Oakland. H. Boezinger, vice president, is in charge of sales for the entire West Coast.

Well Equipment Buys Boiler Equipment Company

Well Equipment Manufacturing Corporation, announces purchase of the physical assets of Boiler Equipment Supply Company of Oklahoma City, following the recent death of Lester O. Thompson, Boiler Equipment Supply Company owner.

All shop equipment has been moved to the "WECO" plant in Houston, where these products will be manufactured for exclusive supply store distribution.

WEIGHT INDICATOR POINTS
SALVAGE RACKS are brim-full of obsolete, worn-out drilling equipment, no longer capable of drilling your wells.
But how about weight indicators and gauges? Are you still trying to get by with control instruments that have long ago seen their best days . . . still trying to cut costs with deadline outfits?
Field facts prove that the Martin-Decker "Sealtite" is increasing footage and reducing costs on wells everywhere. Install one on your next rig—right in front of the driller where he can keep an eye on weight, speed, pressure and torque!
MARTIN-DECKER CORP. LONG BEACH, CALIF.

QUICK REPAIRS ON
CONDENSERS
and
HEAT EXCHANGERS

If you need condenser or heat exchanger repairs **in a hurry** call us. We specialize in fast, high quality work.

25 Years Successful Experience

GULF ENGINEERING CO., INC.
"Service, Not Promises"
7094 NAVIGATION BLVD. HOUSTON, TEXAS
916 S. PETERS STREET NEW ORLEANS, LA.

HOW TO
SAVE MONEY
ON YOUR MUD BILL

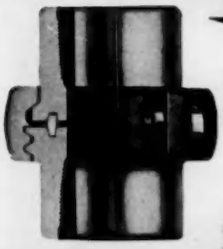
Powdered Chestnut Extract is the only true substitute for Quebracho Extract to reduce water loss, condition your mud cake and keep your mud bill to an absolute minimum.

Carried in stock at all times.

Distributed by
MID-CONTINENT MUD CO.
HOUSTON, TEXAS
JENNINGS, LA.
CORPUS CHRISTI, TEXAS

POWDERED CHESTNUT EXTRACT

NO GASKETS
EVERY Red-Rex UNION
HAS A RENEWABLE



BRONZE
OR
STEEL
SEAL RING

OIL CITY BRASS WORKS
FOUNDERS · MANUFACTURERS · MACHINISTS
Beaumont, Texas, U.S.A.

Socket Screws

The Bristol Company, Waterbury, Connecticut, has prepared a new pocket-sized 10-page folder describing Bristol's line of Hex Socket Screws which include set screws, socket head cap screws, socket head stripper bolts, pipe plugs, tee keys and screw driver type keys. The folder, No. 845, illustrates various styles and gives data on sizes, dimensions, prices, and miscellaneous information.

GarDurloy

Gardner-Denver Company, Quincy, Illinois, has issued a bulletin describing its new GarDurloy high strength, cast iron. The product is said to possess superior properties as a result of the improvements derived from continued research and the introduction of the Sorbo-Mat Process to the metallurgical technology used in the operation of the company foundries.

The company says GarDurloy differs from other high strength cast irons in that it owes its quality to the control of metallurgical reactions in the furnace, and to the elimination of variables through precise technique associated with the treatment of molten metal.

Waterproofing

Primoid Products Corporation, 103 Park Avenue, New York, has issued a new bulletin describing its various rubber-base compounds, designed to stop leaks or seepage through brick, concrete, stucco or other types of masonry. When applied to metal, these Primoid Products will prevent corrosion or rusting since they are resistant to oils, alcohol, gasoline, brine, acids and other chemicals.

Easy to apply, they are said to provide a durable, permanent protective coating which will not peel, chip, or crack, and are unaffected by heat or cold.

Hose Clamping

American Machine & Metals, Inc., East Moline, Illinois, has announced a new method of clamping hose—whether rubber or fabric—the Universal Hose Tool.

The Universal bends the hose band around the hose, then by turning a small wheel and pushing forward, the band is clinched firmly, leaving a permanent, sturdy connection. The Universal Hose Tool is made in small and large sizes and is recommended for liquid, gas or air hose couplings.

REGISTERED PROFESSIONAL ENGINEERS
Air · Gas · Water
REPRESSURING
RECYCLING · PRESSURE MAINTENANCE
INSTALLATION · OPERATION
PETROLEUM ENGINEER
JO H CABLE
WICHITA FALLS, TEXAS
GAS MEASUREMENT · PERMEABILITY
COMPRESSOR PLANTS · POROSITY
BOTTOM HOLE PRESSURE · SATURATION
GAS OIL RATIOS · RECOVERABLE OIL
CONTROL OF FLOW THRU FORMATION
REGISTERED PROFESSIONAL ENGINEERS

Advertisers' Index

In the following index is shown only the advertisers having advertisements in this issue.

Wm. M. Barret, Inc.	67
*The Buda Co.	II Cover
Jo H. Cable	72
*Caterpillar Tractor Co.	44-45
*Clark Bros. Co.	19
The Continental Supply Co.	17
*Darling Valve & Manufacturing Co.	66
*Dowell, Inc.	6
Dulien Steel Products, Inc.	69
*The Edwin H. Fitler Co.	69
Fort Worth Laboratories	67
*Frick-Reid Supply Corp.	Insert, 32
*Gaso Pump & Burner Manufacturing Co.	51
General American Transportation Corp.	2
Gokey Co.	67
*H. P. Gott Manufacturing Co.	70
*Gray Tool Co.	3
Howard Greene Torpedo Co.	69
Gulf Engineering Co.	72
*The Gulf Publishing Co.	61, 68
Gulf States Utilities Co.	61
*Haynes Stellite Co.	4
Houston Laboratories	67
*Hughes Tool Co.	I Cover
*Hunt Tool Co.	23
*Larkin Packer Co.	27
*The Thomas Laughlin Co.	52
*Maintenance Engineering Corp.	59
*Martin-Decker Corp.	71
*McEvoy Co.	56
*Merla Tool Corp.	37
Mid-Continent Mud Co.	72
*Mission Manufacturing Co.	48
*Morse Chain Co.	41
*Oil Center Tool Co.	29
*Oil City Brass Works, Inc.	72
*The Oil Weekly	31
Oil Well Supply Co.	25
*Otis Pressure Control, Inc.	5
Oxy-Acetylene Treating Co.	68
*Pelican Well Tool & Supply Co.	61
*Pittsburgh Steel Co.	35
*Reed Roller Bit Co.	1
*Rollway Bearing Co.	57
A. O. Smith Corp.	III Cover
Southern Pacific Lines	58
*Stoody Co.	21
Texas Electric Steel Casting Co.	IV Cover
*Thornhill-Craver Co.	69
*Tretolite Co.	39
*Union Carbide and Carbon Corp.	4
United States Steel Corp.	25
Warner & Swasey Co.	8
York Oilfield Supply Co.	69

* Indicates that detailed information on the manufacturer's products or services may be found in the 1941 edition of The Composite Catalog of Oil Field & Pipe Line Equipment.